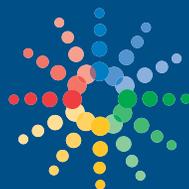VIRTUAL

CMDiT
Center for Minorities and People with Disabilities in IT
Fostering Innovation Through Inclusion

2021 CMD-IT/ACM RICHARD TAPIA
CELEBRATION OF DIVERSITY IN COMPUTING CONFERENCE

SEPTEMBER 14–18, 2021

20 Years of Celebrating Diversity in Computing

acm Association for Computing Machinery

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2021 ACM RICHARD TAPIA

CELEBRATION OF DIVERSITY IN COMPUTING CONFERENCE

SEPTEMBER 14–18, 2021

The **2021 CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference** is sponsored by the Association of Computing Machinery (ACM) and organized and presented by Center for Minorities and People with Disabilities in Information Technology (CMD-IT).

This year's conference marks the 15th occurrence and 20 years since the first Tapia conference in 2001 held in Houston, Texas. Celebrating the technical contributions and career interests of diverse people in computing fields. Additionally, the conference strives to help all attendees — especially students — build vital connections that will serve them well both professionally and personally. The conference aims to provide an educational and supportive networking environment for underrepresented groups across the broad range of computing and information technology, from science to business to the arts to infrastructure.

The Tapia 2021 conference reminds us of the critical role that diverse perspectives play in driving innovations in computing and technology. Creating teams, organizations, and societies that are inclusive and respectful of differences lead to greater innovations that benefit the world.

Fostering Innovation Through Inclusion, CMD-IT's tagline, reminds us of the importance diversity plays in innovation and how we have a responsibility to foster an inclusive environment so that everyone has an opportunity to contribute to society and technology.

CENTER FOR MINORITIES AND PEOPLE WITH DISABILITIES IN INFORMATION TECHNOLOGY (CMD-IT)

CMD-IT's mission is to ensure that our target communities are fully engaged in computing and information technologies and to promote innovation that enriches, enhances, and enables these communities so that more equitable and sustainable contributions are possible by all communities. CMD-IT advocates for African Americans/Blacks, Native Americans/Indigenous People, Hispanics/Latinx, and People with Disabilities in IT, and supports students and professionals via workshops that focus on building leadership skills, establishing connections via networking, and developing effective career strategies. CMD-IT serves as a resource for the development of our target communities in computing.

CMDiT
Center for Minorities and People with Disabilities in IT
Fostering Innovation Through Inclusion

Academic Careers Workshop

The goal of the annual workshops is to mentor assistant and associate-level faculty, senior doctoral students and postdocs from our target communities about the academic career ladder. The workshop includes panels of diverse senior faculty talking about the tenure and promotion process, launching a research program, effective teaching, proposal writing, and alternative career paths. In addition, the workshops include mock proposal review panels that utilize actual proposals. The workshops are funded by NSF.

LEAP Alliance

The goal of the LEAP (Diversifying LEAdership in the Professoriate) Alliance is to address the broadening participation challenge of increasing the diversity of the future leadership in the professoriate in computing at research universities as a way to achieve diversity across the field. The LEAP Alliance addresses this issue by bringing together a small number of departments across four cohorts that are responsible for producing the majority of the professoriate or having good diversity with its doctoral graduates. The LEAP Alliance focuses on doctoral students to enter the professoriate as well as undergraduate students to attend doctoral programs and then on to the professoriate. The Alliance targets students from the following communities: African Americans, Latinx/Hispanics, Native Americans or Indigeneous Americans, and People with Disabilities. The LEAP Alliance is funded by Sloan and NSF.

University Award

The CMD-IT University Award recognizes US institutions that have demonstrated a strong commitment to increasing the computer science baccalaureate degree production of minorities and students with disabilities, through effective retention programs. Award decisions will be based on quantitative and qualitative reporting of results. The award recipient receives a $15,000 award and plaque as well as an invitation to discuss the effective retention strations at the Tapia Conference.

Student Professional Development Workshop

The annual workshop provides undergraduate and masters level students in computing with the unique opportunity to receive coaching and development from Industry professionals about the job application and interview processes. The workshop is held at the Tapia Conference each year.

Innovation Solutions Challenge

The Innovation Solutions Challenge provides an opportunity for students to use technology to tackle real-world problems identified by industry. The challenges also provide an opportunity to engage with industry professionals to collaborate with and seek advice on innovative solutions.

Tapia Conference Series

CMD-IT is the presenter and organizer of the annual Richard Tapia Celebration of Diversity in Computing Conferences. The Tapia Conferences were created to bring together undergraduate and graduate students, faculty, researchers and professionals in computing to connect with others of common backgrounds, obtain advice from leaders in the field, and be inspired by great presentations and conversations. The Tapia Conference is the premier venue to acknowledge, promote, and celebrate diversity in computing.

For more information, please visit **www.cmd-it.org.**

WELCOME

For the second year in a row, we are gathering to celebrate diversity in computing in a virtual environment. We learned a great deal from organizing our first virtual event and we received valuable feedback from the community. We are excited to present an even more inclusive, engaging event this year.

We all experienced a tumultuous and painful 2020 in the intersection of the inequities of racial trauma and COVID-19. This new year has presented signs of hope but the recovery has been uneven and there are still deep wounds in our community and world. We feel the opportunity to gather together with the Tapia community is a concrete way we can support one another.

Our theme this year is **20 Years of Celebrating Diversity in Computing**, and it honors that community. We recognize the legacy of everyone who has been involved in Tapia over the past two decades. Tapia has and continues to foster excellence while supporting and building community among so many who felt disconnected. We expect that our panel of past chairs, our speakers, and our program will help to inspire you on how you plan to contribute and innovate for positive change in your own communities and through the Tapia conference in the next 20 years.

We are delighted and honored to present to you all the submissions for Tapia 2021. With the help of our Technical Program Chairs and committee members, we selected 19 Birds-of-a-Feather sessions (BoFs) as well as 61 Workshops and Panels. Our Poster Committee selected 25 excellent student posters (from 90 submissions). For the fifth time, Tapia also hosts an ACM Student Research Competition (SRC) featuring 11 student poster participants. Our inspirational and extraordinary plenary and banquet speakers connect us to experienced leaders in our community. Finally, we complement these program activities with a series of professional and development panels as well as the Doctoral Consortium.

We are deeply indebted to the dedication, contributions, and financial support from a diverse set of people and organizations. In a year filled with uncertainty, isolation, and hardship, we are even more grateful to the commitment from the Tapia 2021 Infrastructure and Technical Program Committees: these volunteers who come from academia, research labs, industry, government, and non-profits make the conference possible. We also wish to acknowledge all supporters of Tapia 2021, especially our Corporate Supporters for their unwavering support and commitment. In part, their financial support had resulted in the attendance of over 380 scholarship recipients and 4 Doctoral Consortium participants.

Since we realize how many people miss the in-person, small group conversations, we have made special efforts to preserve such an experience online by creating an Engagement Committee. We hope you take advantage of Discord, an additional engagement platform that we have offered you, to make those connections. Those conversations with mentors, advocates, colleagues and peers at Tapia can serve to establish long lasting relationships that help your career path, feed your soul, and create alliances that change the world. We hope that despite the physical distance between us, you can find a way to connect and create new, meaningful friendships, collaborations, and communities. May these connections help to build a more robust, diverse, equitable, and inclusive culture in computing--one that is capable of tackling many of the complex societal and ethical issues we are currently facing across the globe. Here is to 20 more years of the Tapia Celebration!

Rob Parke
General Chair Tapia 2021

Patti Ordóñez
Program Chair Tapia 2021

Rob Parke
General Chair Tapia 2021

Patti Ordóñez
Program Chair Tapia 2021

FEATURED SPEAKERS

FIRESIDE CHAT SPEAKER

Dr. Valerie Taylor
CEO and Founder
of The Center for
Minorities and People
with Disabilities in IT

Susie Armstrong
Senior Vice President
of Engineering at
Qualcomm

Daby Sow
Director of Hybrid
Cloud Services at IBM

PLENARY KEYNOTE SPEAKERS

Dr. John Herrington
Former NASA
Astronaut, Chickasaw
Nation

Dr. Omar Florez
Machine Learning
Researcher at Twitter
Cortex

Jenny Lay-Flurrie
Chief Accessibility
Officer at Microsoft

PLENARY KEYNOTE SPEAKER
KEN KENNEDY DISTINGUISHED LECTURE

Dr. Cecilia Aragon
award-winning
author, airshow pilot,
and the first Latina
full professor in the
College of Engineering
at the University of
Washington in Seattle.

MEET DR. RICHARD TAPIA

DR. RICHARD A. TAPIA is a mathematician and professor in the Department of Computational and Applied Mathematics at Rice University in Houston, Texas. He is internationally known for his research in the computational and mathematical sciences and is a national leader in education and outreach.

Among his many honors, Tapia was the first Hispanic elected to the National Academy of Engineering. In 1996 President Clinton appointed him to the National Science Board, where he served until 2002, and from 2001 to 2004 he chaired the National Research Council's Board on Higher Education and the Workforce. Tapia has received the National Science Foundation's inaugural Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring; the Lifetime Mentor Award from the American Association for the Advancement of Science; the Distinguished Service to the Profession Award from the Society for Industrial and Applied Mathematics; the Distinguished Public Service Award from the American Mathematical Society; the Distinguished Scientist Award from the Society for the Advancement of Chicanos and Native Americans in Science; and honorary doctorates from Carnegie Mellon University, Colorado School of Mines, Claremont Graduate University, the University of Nevada-Reno, the University of Rhode Island-Kingston, and Harvey Mudd College.

Tapia was also the first recipient of the Computing Research Association's A. Nico Habermann Award for outstanding contribution to aiding members of underrepresented groups within the computing research community;

named one of 20 most influential leaders in minority math education by the National Research Council; listed as one of the 100 most influential Hispanics in the U.S. by Hispanic Business magazine; and given the "Professor of the Year" award by the Association of Hispanic School Administrators, Houston Independent School District, Houston, TX. In 2005, Tapia was elected to the Board of Directors for TAMEST, which is composed of the Texas members of the National Academy of Engineering, National Academy of Sciences, and the Institute of Medicine. Tapia was honored with the 2016 American Association for the Advancement of Science's Public Engagement with Science

Award for his remarkable career blending world-class scholarship, admirable mentoring and profound contributions to science, technology, engineering and mathematics education and public engagement.

In 2014 Tapia was awarded the National Science Board's Vannevar Bush award for his extraordinary leadership, inspiration, and advocacy to increase opportunities for underrepresented minorities in science, distinguished public service leadership in science and engineering, and exceptional contributions to Mathematics in the area of computational optimization. In 2011 President Barack Obama presented the National Medal of Science to Tapia for his pioneering and fundamental contributions in optimization theory and numerical analysis and for his dedication and sustained efforts in fostering diversity and excellence in mathematics and science education. Professor Tapia is recognized as a national leader in diversity and has delivered numerous invited addresses at national and international mathematics conferences, served on university diversity committees, and provided leadership at a national level. Two professional conferences have been named in his honor, recognizing his contributions to diversity: Richard Tapia Celebration of Diversity in Computing conference and the Blackwell-Tapia Conference, whose founders described Tapia as a seminal figure who inspired a generation of African-American, Native American and Latino/Latina students to pursue careers in mathematics.

TAPIA ACHIEVEMENT AWARD

RICHARD A. TAPIA ACHIEVEMENT AWARD FOR SCIENTIFIC SCHOLARSHIP, CIVIC SCIENCE AND DIVERSIFYING COMPUTING

The Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Computing is given annually to an individual who is a distinguished computational scientist, computer scientist or computer engineer and who is making significant contributions to civic areas such as teaching, mentoring, advising, and building and serving communities. The individual is also one who demonstrates extraordinary leadership in increasing the participation of groups who are underrepresented in the sciences.

Dr. Jamika D. Burge leads the Experiences Products and Platforms Design team at Capital One, where she leads a team of researchers who develop human insights, at scale, including Eno, the conversational AI. She is the co-founder of Capital One's *Intersectional Symposium*, which focuses on intersectionality as fundamental to exploring the dimensions of how our lived experiences matter in the products and experiences we create for each other and customers, and she contributes to the *Fair and Responsible AI Principles* initiatives. At Capital One, she is also a member of the Blacks in Tech (BIT) Leadership team, where she leads strategic operations that measure the efficacy of professional development opportunities for Black associates and allies. Prior to joining Capital One, she served as a tech consultant to DARPA, the Defense Advanced Research Projects Agency, in the Information Innovation Office. While there, she provided technical and management consultation for innovative DARPA programs which were funded at over $70M. She is an authority in research and programming that investigates the intersectionality of Black women and girls in computing, which led her to co-found blackcomputeHER.org (pronounced 'black computer'), an organization dedicated to supporting computational thinking, design thinking, and workforce development for Black women and girls in computing+tech. Jamika is also Founder and Principal of Design & Technology Concepts, LLC, a tech consultancy that focuses on computer science education & research and inclusive design. She has consulted for Google, the National Center forWomen in Technology (NCWIT), the American Association of Colleges & Universities (AAC&U), the University of North Carolina at Charlotte, among others. She is also affiliated with the Thurgood Marshall College Fund (TMCF) as a research scientist consultant.

Jamika holds a PhD in computer science and applications from Virginia Tech. She and her work have been featured in the New York Times and ComputerWorld, she was recognized by HackBright Academy as a Top Tech Leader to Watch, and in 2021, she was recognized by Technical.ly as one of 20 tech connectors building and supporting community through entrepreneurship and innovation in the DC Metro area.

TUESDAY

SEPTEMBER 14, 2021

Student Professional Development Workshop

11am - 12pm CDT
Welcome & Panel Discussion: Preparing Your Resume and Virtual Career Fair

12:15pm - 1:30pm CDT
Resume Clinic (Invitation Only)

2pm - 2:45pm CDT
Panel Discussion: Are You Ready For Your Virtual Interview?

3pm - 4:30pm CDT
Interview Clinic and Closing (Invitation Only)

Doctoral Consortium
11:45am - 12:30pm CDT
Systemic Review of Virtual Reality for the Treatment of Mental Disorders Associated with Gender-Based Violence by Hamida Khatri

12:45pm - 1:30pm CDT
A Topology-Aware Sampling-Based Motion Planner by Aakriti Upadhyay

1:30pm - 2:30pm CDT
Doctorial Consortium Networking Lunch Sponsored by Uber

2:30pm - 3:15pm CDT
Node-centric Community Detection and Evolutionary Prediction in Dynamic Networks by Oluwafolake A Ayano

3:30pm - 4:30pm CDT
Understanding and Addressing Accessibility Barriers Faced by People with Visual Impairments on Block-based Programming Environments by Aboubakar Mountapmbeme

TUE

WEDNESDAY

SEPTEMBER 15, 2021

10am - 10:45am CDT
STARS Meeting (Invite Only)

11am - 11:15am CDT
Welcome & Opening Remarks

12:30pm - 2:30pm CDT
Career Fair & Poster Sessions

12:30pm - 1:15pm CDT
Early Career Panel Discussion

Leveraging computer science to advance biomedicine with genomic data

Making It Stick: The Data Science Instructional Escape Room

Multilingual Student Resources for Equitable K-12 Computer Science Instruction

Supporting Student Mental Health: How to Connect Students with Resources and Overcome Stigmas

12:30pm - 1:45pm CDT
How to Engage in AI Research as an Undergraduate?

Taking on the Technical Interview 2021

TAs For Inclusion: Creating a Supportive and Diverse Community Through an Effective Teaching Assistants

1:30pm - 2:15pm CDT
Build Platforms & Relationships! Power Tools for a Successful Career in Infra Engineering

Leveraging Relationships for Success in Graduate School: Identifying Barriers and Strategies to Navigate Faculty, Staff, and Peer Relationships in Computing Graduate Programs

Machine Learning to Turn Customer Complaints into Actionable Insights

MythBusters – Working at a National Laboratory Abstract

The NSF's BPC Initiative: Resources and Opportunities to Contribute

Working with young people and teachers in low-income areas to improve access to and participation in computing

1:30pm - 2:45pm CDT
The Conversation We All Need to Have Part I: Accessibility and Disability - Classroom to Career

2:45pm - 3:30pm CDT
Featured Speaker

Live Your Dreams! - Dr. John Harrington, (Retired) NASA, Chickasaw Nation

3:30pm - 5:45pm CDT
Career Fair, Poster, Networking

3:45pm - 4:30pm CDT
Designing an Online Course that is Accessible and Inclusive of Students with Disabilities

Hispanics in Computing Community

I have a job as a software engineer! Now what do I do?

Multimodal Machine Learning: How to approach?

PhD Research and Engineering @ Google

Strategies for Building Momentum and Buy-in for BPC Efforts

3:45pm - 5pm CDT
What Are Your Papayas? Assimilating to Belong in Computing

Basics of Digital Forensics and Cyber Incident Response

Next-Generation Secure Computer Systems: Post-Quantum Cryptosystems

Do You Want an Internship? Here's How: A Crash Course on How to Get an Internship in Tech

4:45pm - 5:30pm CDT
"INCLUSIVE LEADERSHIP 101: Better people, better People!"

A new class of teaching faculty: No PhD required

Current Applications of Data Science from our National Laboratories

How Student Leadership Drove Rewriting the Code's Response to the Pandemic and More than Doubled the Size of the Student Community

Modeling COVID-19 Infection Risks and Mitigations in Air Travel

My Autism Journey - From Self-Doubt to Acceptance

Supporting Women in IS, the Importance of Mentoring

6:30pm - 8pm CDT
Career Fair & Networking

8pm - 9pm CDT
MasterCard Student Networking Event

THURSDAY

SEPTEMBER 16, 2021

10am - 10:45am CDT
STARS Meeting (Invite Only)

11am - 11:15am CDT
Welcome & Opening Remarks

11:15am - 12:20pm CDT
Keynote Speaker
Accessibility at Microsoft by Jenny Lay-Flurrie, Chief
Accessibility Officer

12:30pm - 5:30pm CDT
Career Fair, Poster sessions and Networking

12:30pm - 1:15pm CDT
Build your Career and Community through Authentic Personal Branding

Conversations with Faculty about Student Mental Health

How to Navigate Nabbing your Dream Internship

Making Wise Technology Investments Using the Six Machine Learning Essentials

Sickle Cell Stories: Presentation from CMD-IT 2021 Innovation Award Winning Team

What do Computer Scientists & Engineers say on their experience of corporate culture?

12:30pm - 1:45pm CDT
Navigating Research, Teaching, and Service when Traversing from Assistant to Associate to Full

Coaching for Advancing Your Career

My Journey in Tech Panel: What Does Success Look Like?

Trireme: A RISC-V Open-Source Architecture Design Space Exploration Toolbox

1:30pm - 2:15pm CDT
Avengers: Perspectives on Cyber Security for Critical Infrastructure from our National

Disability Disclosure in Education and Employment

Leveraging Personal Growth for Professional Success

Using Your Tech Skills In Public Service to Create Impact: Perspectives in Civic Tech

Where do I fit?: Success Strategies That Have Helped Me as a Tech Professional

2:45pm - 3:30pm CDT
Cross-pollinating Undergraduate STEM Education Using Project-Based Learning

Data Sovereignty for Native Communities

Disasters happen, be prepared!

OJT Bootcamp: Developing STEM Professionals the Right Way

Pathways for PhDs: A Panel Hosted by Google

Teach Access Virtual Study Away

2:45pm - 4pm CDT
Centering Learning and Equity in Assessment

IBM Enterprise DevOps & Automation

Moving from career anxiety to career exploration!

Performing Confidence: Embrace, Experience and Embody

THU

THURSDAY
CONTINUED

3:45pm - 4:30pm CDT

Balancing thought and people leadership

Diversity Includes Disability Includes Mental Illness: Expanding the Scope of DEI Efforts in Computer Science

En Español, Academic Pathways in Computer Science

From Productivity to Purpose

Navigating the Waters of Allyship

Real World Impact through Innovative Research and Curricular Programs

3:45pm - 5pm CDT

Continuing the Conversation Part II: Accessibility and Disability - First Job to Successful Career

HPC in a nutshell - an introduction to various topics in High-Performance Computing

4:30pm - 5:15pm CDT

Growing National Communities for Black and Latina College Women in Tech

Leveraging Data for Good: Using Data to Create Equitable K-12 CS Education

Owning your story: How being the child of immigrant parents can make you a better industry professional

Paving a Pathway into Technology: Getting Your First Job

Teaching and Learning Accessibility

5:30pm - 6:15pm CDT

20 Years of Celebrating Diversity: Reflections from Past Conference Chairs
Valerie Taylor, Director, MCSArgonne National Laboratory/ CMD-IT, **Bryant York,** Professor Emeritus Retired Professor, **Pamela Williams,** LMI, **Manuel A. Pérez,** Quiñones,University of North Carolina at Charlotte**, Dilma Da Silva,** Texas A&M University**, Tao Xie,** Peking University

6:30pm - 8pm CDT

Career Fair & Networking

FRIDAY

SEPTEMBER 17, 2021

10am - 10:45am CDT
STARS Meeting (Invite Only)

11am - 11:15am CDT
Welcome & Opening Remarks

11:15am - 12:20pm CDT
Distinguished Ken Kennedy Lecturer
What do the following two careers have in common: (1) data science professor, and (2) airshow pilot?
Cecilia R. Aragon, University of Washington

12:30pm - 4pm CDT
Career Fair & Networking

12:30pm - 1:15pm CDT
Accessibility Research Centers: What they are and how to become involved

Build a Social Media Presence to Grow and Advance Careers: the Minority Edition

Effective Student Retention Strategies

12:30pm - 1:45pm CDT
Cloud-Enabled IoT Workshop: AWS IoT and Google IoT Platforms

Data Streaming and Real-time Data Analytics

Qualcomm - Come invent with Us

Technology Transfer in Academia

The SWDCS Alliance: A RPP Focused on Broadening Participation of African American and Hispanic Students with Disabilities in Computer Science and Artificial Intelligence

When It Hits the Fan: What to do to Survive a Mental Health Crisis as a Professional

1:30pm - 2:15pm CDT
Accessibility Makes Sense for Everyone

Increasing Diversity in Computing: Sharing of Good Practices

Introduction to Deep Learning using CNNs

Modern Portfolio Theory

Understanding of the needs of students with disabilities based on Universal Design of Learning principle

2:45pm - 3:30pm CDT
Diversity includes Disability

Envisioning Leadership: Strategies for Academic Career Development and Advancement

Have you heard of the saying " UX is a fluffy science"? If you have worked in industry, I'll bet you have

Innovative Ways to Improve Small Liberal Arts College Computer Science Department Cultures, Communities, and Curricula

So You're a New Latinx Faculty … Now What?

Understanding & Leveraging Diversity In Job Search

2:45pm - 4pm CDT
A Seat At The Table: Candid Conversation on Diversity, Equity, and Inclusion

Cyber Forensic Analyses: When There is More Than Meets the Eye

IBM Z Cybersecurity: Design for Protecting Data in Use

4:15pm - 5:30pm CDT
Awards Ceremony, Richard Tapia Award Presentation and Closing Remarks

5:30pm - 6pm CDT
Virtual Celebration

6pm - 8pm CDT
Networking

SATURDAY

SEPTEMBER 18, 2021

Post Conference Activities

STARS Celebration | **Conference Program**

11:00am - 12:00pm

Welcome & Panel Discussion: Preparing Your Resume and Virtual Career Fair

Ronal Metoyer, University of Notre Dame**, Terry Davis,** IBM**, Jordan Kessler,** Dropbox

11:45 AM - 12:30 PM

TECHNICAL

Systemic Review of Virtual Reality for the Treatment of Mental Disorders Associated with Gender-Based Violence

Hamida Khatri

Virtual Reality (VR) has made an incredible impact in the healthcare industry supporting clients with mental and psychological illnesses such as addiction, phobias, and obsession with the help of cognitive behavioral therapy (CBT) and exposure therapy (ET). Recent studies confirm VR as a certified tool in generating rapid and lasting improvements to mental health patients, it has now shifted gears in creating a more inclusive environment for violent offenders to empathize with abuse and trauma victims. But such studies have been limited to reducing the levels of aggression and improvement in empathy from the perspective of the abuser. Despite the encouraging success of VR applications for the treatment of varied mental disorders, no study, of which the author is aware, has explored the usability of VR specifically for treating the conditions associated with Gender-Based Violence (GBV) victims. There is a striking distinction between tackling GBV and treatment of conditions as consequences of the horrifying traumatic experiences of the victims, including, physical, reproductive, social, economic, emotional, and psychological. The scope of this paper centers around the emotional and psychological effects of GBV on the victims. Therefore, the aim is to review the current successes of VR applications in the psychological research space and to purpose a therapeutic framework for a VR model exclusively designed for the victims of GBV.

12:15pm - 1:30pm

Student Professional Development Workshop: Resume Clinic

12:45 - 1:30 PM

TECHNICAL

A Topology-Aware Sampling-Based Motion Planner

Aakriti Upadhyay

As human beings, we often solve complex problems by solving them sequentially and/or using multiple levels of abstraction. For instance, when planning our motion from one place to another, we plan a path by spontaneously avoiding collision with the obstacles on our way. Such a problem becomes computationally difficult to solve when it comes to an autonomous robotic system. The computational problem of finding a valid path from source to destination while satisfying the robot's constraints is known as the motion planning problem. A robot often requires pre-planned information about its surroundings that effectively avoid colliding with obstacles when planning its path. Sampling-based planners have proven effective in these domains by finding a solution if one exists, as the number of sampled robot configurations in the space goes to infinity. However, the topological information extracted by these planners is either not reusable or does not provide much information about the robot's space. In this work, we introduce an analytical or computational tool that exploits both the topological and geometrical representations of the robot's environment to attain an improved efficiency for sampling-based methods with low computation time and memory. We used the Vietoris-Rips complex method to construct a clique using graph components, i.e., vertices and edges, and performed symmetric differences to remove vertices that were part of more than one clique. The topological graph preserved the important collision-free vertices of the environment representing unique regions of free space. We formally defined the relation between a real-valued function, i.e., discrete Morse function, and the clique to extract the geometrical representation of the obstacles in this environment. The discrete Morse function applied on the topological graph identified intricate corner points of the obstacles that helped planning a shorter path at a safer distance from the obstacles.

2:00 pm - 2:45 pm

Panel Discussion: Are You Ready for Your Virtual Interview?

Ronald Metoyer, University of Notre Dame**, Terry Davis,** IBM**, Jose Eguizabal,** Dropbox

2:30 - 3:15 PM

TECHNICAL

Node-centric Community Detection and Evolutionary Prediction in Dynamic Networks

Oluwafolake A. Ayano

Advances in technology have led to the availability of data from different platforms such as the web and social media platforms. Much of this data can be represented in the form of a network consisting of a set of nodes connected by edges. The nodes represent the items in the networks while the edges represent the interactions between the nodes. Community detection methods have been used extensively in analyzing these networks. However, community detection in evolving networks has been a significant challenge because of the frequent changes to the networks and the need for real-time analysis. Using static community detection methods for analyzing dynamic networks is problematic since such methods do not retain a network's history and cannot provide real-time information about communities in a network. As for existing incremental methods, these approaches treat changes to the network as a sequence of edge additions and/or removals; however, in many real-world networks, changes occur when a node is added with all its edges connecting simultaneously. For efficient processing of such large networks in a timely manner, there is a need for an adaptive analytical method that can process large networks without recomputing the entire network after its evolution and treat all the edges involved with a node equally. We proposed a node-centric community detection method that incrementally updates the community structure in the network using the already known structure of the network to avoid recomputing the entire network after each change.

3:00 pm - 4:00 pm
Student Professional Development Workshop: Interview Clinic & Closing

3:30 - 4:15 PM
TECHNICAL
Understanding and Addressing Accessibility Barriers Faced by People with Visual Impairments on Block-based Programming Environments
Aboubakar Mountapmbeme

Block-based systems (e.g. Scratch, AppInventor) are a popular means to promote Computer Science For All. The ease of interaction and the ability to focus on semantics over syntax when programming are appealing to many, with activities such as Hour of Code and inclusion as the programming environment in many novice programming (robotics) kits serving as exemplars for the assertion. However, many students with disabilities are not served by block-based systems as they are currently designed and as such negatively impacts diversity and inclusion. The proposed work seeks to improve access to block-based programming for persons with visual impairments by focusing on the impact of keyboard navigation schemes and audio cues with code navigation and code understanding. In addition to the technical effort required, the appropriate design of accessible keyboard navigation and audio cues to best match users' mental models (cognitive maps) of navigation and code understanding is also essential.

11:20 AM - 12:20 PM
EXECUTIVE FIRESIDE CHAT

Taking Advantage of the Computing Continuum

Valerie Taylor, Susie Armstrong, Daby Sow

Advances in technology have resulted in increasing scales and pervasiveness of compute and data. In particular we are seeing a proliferation of edge computing (e.g., computational processing of sensor data close to the logical edge of the network and away from centralized computing) as well as increases in the use of cloud computing. The computing continuum aims at aggregating an ecosystem of distributed resources to support data-driven workflows. The distributed resources include devices ranging from edge computing, intelligent devices, cloud computing to HPC systems. The fireside chat will focus on how industry is leveraging the computing continuum, or particular parts of the computing continuum, to address their challenges or developing technologies that are part of this continuum.

12:30 - 1:15 PM
BROADENING PARTICIPATION IN COMPUTING

Supporting Student Mental Health: How to Connect Students with Resources and Overcome Stigmas

Colleen M. Lewis, Colleen M. Lewis, Ananya Cleetus, Nathan Lambert, Emily Naviasky

While there are many useful and well thought-out programs highlighting supportive mental health practices, many new initiatives are less successful than they might be due to limited resources such as professional care, student stigmas or misconceptions around seeking help, and difficulties publicizing the initiatives to the students who would most benefit. In this panel, we will discuss the many levels that promoting student mental health can operate at to have the greatest effect. Panelists will discuss why and how to prioritize de-stigmatizing accessing help, streamline access to care, train department members on how they can help, and re-imagine mental-health-first educational systems. The panelists bring a variety of experiences on improving mental health programs in higher education through peer programs, entrepreneurship, training, and helping shape mental-health initiatives.

12:30 - 1:15 PM
PROFESSIONAL DEVELOPMENT

Making It Stick: The Data Science Instructional Escape Room

Valerie Nelson, Valerie Nelson, Jason Crea

Over the past decade, the term "data science" quickly turned from a popular word used in memos and briefs to an essential area of responsibility which was going to involve many facets. Although operations research, cryptography, and other pre-existing areas involved multiple aspects of what we now call data science, the vast and rapidly changing data environment presented new challenges which have not been previously encountered. In response to the need for talent, many new hires with expertise in STEM fields started in their new roles as Data Scientists, while others had to adapt to new responsibilities and challenges as converted Data Scientists in their current organizations. However, the challenge does not stop at hiring and retaining talent; it also requires being able to train this talent to confidently apply techniques and develop solutions within large organizations such as the government. While addressing this challenge, a data scientist and applied research mathematician with education and training expertise created and implemented an Instructional Escape Room (IER) as a review activity in the Data Science Fundamentals (DSF) course developed in 2017 for some of the U.S. government's onboarding Data Scientists. In this talk, we outline some of the DSF course topics, describe aspects of the IER, and discuss observations and outcomes of the experience. We also provide some general guidance for how to implement such training experiences online.

12:30 - 1:15 PM

Leveraging computer science to advance biomedicine with genomic data

Andy Dahl, Harold Pimentel, Karishma Chhugani, Serghei Mangul, Andy Dahl

During the past decade, the rapid advancement of high-throughput technologies has reshaped modern biomedical research by vastly extending the diversity, richness, and availability of data across genetics, genomics, medical imaging, and health records. This data deluge presents both enormous opportunities and challenges that require a high degree of computational expertise, which has not been traditionally prioritized in biological pedagogy or research. Therefore, this moment presents a unique opportunity for computer scientists

to make scientific discoveries with true biomedical significance. This progress may manifest through primary analysis of basic and clinical datasets, secondary analysis of burgeoning public resources on millions of patients and phenotypes, or development of novel machine learning algorithms for diagnosis or precision treatment recommendations. We will particularly focus on ways we bring our computational training to bear on applied biomedical problems. For concreteness, we will describe several specialized skills for computational biology, including familiarly with key bioinformatic tools, data analysis, visualization, and large-scale computing systems. We will describe how we closely collaborate with domain experts in laboratory technology, basic biology, and clinical practice in order to maximize our impact on human health. We will also highlight several opportunities for undergraduate research experimental in biomedical data science. Finally, we will discuss our respective transitions from purely computational backgrounds to our current positions as computational biologists, highlighting a non-traditional pathway towards biology that will only grow in prominence and impact.

12:30 - 1:45 PM
PROFESSIONAL DEVELOPMENT
Taking on the Technical Interview 2021
Eric Yurko, Antoine Picard, Cynthia Lee

The job search (be it for an internship or a full-time) for a software engineering position usually involves one or more technical interviews. We'd like to provide tips, tricks, strategies and practice to help you present your technical abilities during this often stressful process.

12:30 - 1:45 PM
BROADENING PARTICIPATION IN COMPUTING
How to Engage in AI Research as an Undergraduate?
Anita Raja, Monica Andreson, Rogelio Cardona-Rivera, Maria Gini, Shanna Watter

We propose a technical workshop targeted to undergraduate students to expose them to research and get them engaged in research at their own University or in a Summer research program. Exposure to research is a critical factor that affects future consideration for graduate studies. Too few undergraduates from underrepresented groups consider research as a career path, and, as a result, their numbers in graduate programs are severely lagging their already low numbers in undergraduate programs in computing.

12:30 - 1:45 PM
BROADENING PARTICIPATION IN COMPUTING
TAs For Inclusion: Creating a Supportive and Diverse Community Through an Effective Teaching Assistants Program
Concepta Njolima, Concepta Njolima, Emely Damaris Alfaro Zavala, Sama Manalai, Immanuela Belaineh, Scott Heggen, Jasmine Jones

To support the growth and inclusivity of CS programs, a diverse body of teaching assistants allows students to pursue their education in an environment where they are seen, heard, and represented. This workshop's goal is to help attendees create a supportive and diverse CS community through teaching assistants. We hope to address questions such as: How do I start an inclusive TA program? How do I change a culture that is not inclusive? What does leadership in a TA program look like when it respects diversity? How can an inclusive TA program impact student and TA experiences? How do I better manage an existing program that is diverse and inclusive? In this two-part workshop, we will first share our experiences as underrepresented students in computing and as undergraduate Teaching Assistants. We will discuss how the Teaching Assistant program has impacted our education, the importance of encouraging teaching assistants to embrace diversity, and the value of empowering students to be leaders in the TA program. We will also reflect on how we each create a safe space for unjudged learning in our courses and tutorial lab. Second, attendees will discuss and develop a shared, collaborative set of Teaching Assistant Best Practices. They will leave with a set of tools for creating an effective and inviting teaching assistant program at their institution. The intended audiences for this workshop are current or prospective undergraduate and graduate teaching assistants, and professors or administrators who work with teaching assistants.

1:30 - 2:15 PM
TECHNICAL
Machine Learning to Turn Customer Complaints into Actionable Insights
Subhashini Tripuraneni, Lisa Wheeler, Subhashini Tripuraneni, Lily Wang

Customer complaints contain nuggets of information that if extracted and analyzed at scale can be transformational to building better products and business processes, creating unique and differentiated experiences for customers. Complaints data is unstructured and it is challenging to

generate actionable insights at scale. Each customer service representative has a unique style in writing the complaint, with no consistent use of abbreviations detailing the problem experienced by customer. Also, designating categories defining the type of complaint is subjective. Being able to conduct root-cause analysis on these complaints is labor and time intensive, delaying the remedial steps required to improve products and processes and therefore, exposing financial institutions to risk. With Machine Learning (ML) and Natural Language Processing (NLP), unstructured data reported as part of the complaints can be effectively mined, generating key themes, highlighting problem areas, and surfacing issue details. Not only can ML and NLP bring scale to analyzing complaints, but also when applied on both complaints and underlying transactional data has the potential to transform customer service. Root cause analysis on issues can be conducted with quick turnaround time, reducing the potential risk that financial institutions are exposed to, and increasing the ability to provide better services to our customers.

1:30 - 2:15 PM

BROADENING PARTICIPATION IN COMPUTING

Leveraging Relationships for Success in Graduate School: Identifying Barriers and Strategies to Navigate Faculty, Staff, and Peer Relationships in Computing Graduate Programs

Kari George, Kari George, Chris Hovey, Elise Dorough, Raul Platero, Hari Sundaram

This panel brings together doctoral student, faculty, staff, and researcher perspectives from the University of Illinois Urbana-Champaign, the University of Washington Seattle, and the National Center for Women & Information Technology's (NCWIT) Extension Services for Graduate Programs (ES-Grad) to address a critical element of success in graduate school — managing relationships. Panelists will discuss common barriers and pitfalls in relationships with faculty, staff, and students in computing departments, as well as actionable strategies for initiating and maintaining a strong network that support students' success and degree completion. The focus will be on doctoral student relationships, though faculty advisors, prospective students, and staff will also benefit from learning about how they can approach relationships with students.

1:30 - 2:15 PM

BROADENING PARTICIPATION IN COMPUTING

Working with young people and teachers in low-income areas to improve access to and participation in computing

Hayley C. Leonard, Hayley C. Leonard, Lenandler Singh, Yolanda Payne, Halima Nessa

The COVID-19 pandemic has highlighted existing inequalities in access to computing devices, showing how much more needs to be done to close the digital divide between families with differing levels of economic resources. However, lack of a digital device for home use is only one factor impacting broadening participation in computing to low-income families. Young people from these families may also be less likely to have access to computing curricula in school and to opportunities to develop their skills outside of school. Without access and support at all of these levels, young people may find it difficult to develop a sense of belonging in computing, and will continue to be underrepresented within the computing community. This panel takes an international perspective in discussing the challenges faced and lessons learned from working with young people in low-income areas, presenting both hands-on experience and research conducted in formal education and non-formal contexts in the United States, Guyana, and the United Kingdom.

1:30 - 2:15 PM

PROFESSIONAL DEVELOPMENT

Not the People Who Build the Roads: Infrastructure Engineering in the Software World — Drive Your Career on a Different Route

Lily Wittle

Infrastructure engineering is an often-overlooked piece of the full stack. As an engineer on a platform team at LinkedIn, I'll highlight unique facets of infrastructure engineering and how you can use them as opportunities for growth. Specifically, you'll learn how to establish yourself as a leader when in a supporting role, cultivate strong working relationships with others, navigate difficult conversations to find alignment with partner teams, and leverage strengths of typical female communication styles to not only find a sense of belonging, but to thrive in a male-dominated environment.

1:30 - 2:15 PM

BROADENING PARTICIPATION IN COMPUTING

The NSF's BPC Initiative: Resources and Opportunities to Contribute

Colleen M. Lewis, BurÃ§in Tamer, Allyson Kennedy, Colleen M. Lewis, Ronald Metoyer, Luther Tychonievich, Michelle Rogers

Broadening participation in computing (BPC) requires our individual and collective effort. The National Science Foundation is leading an effort to encourage NSF PIs and all computing departments to create BPC plans. Panelists will share resources and advice for how attendees can get involved. Students, staff, and faculty can all play an important role in broadening participation in computing. Since the NSF initiative and supporting resources on BPCnet.org are relatively new, attendees can help by sharing information within their institution and broader network.

1:30 - 2:15 PM

NATIONAL LABS

Myth Busters — Working at a National Laboratory Abstract

Madalynn Miller, Frank Trigueros

What is a National Laboratory? Do they offer internships? What is scientific computing? How can I learn more about supercomputing? Do they employ non-U.S. Citizens? This is an interactive discussion and information session for those who are actively exploring and educating themselves about diverse career path options and looking for gems of opportunity in terms of internships (summer or other types), funding programs, and research or postdoc program opportunities. Presenters will discuss the importance of the student internship (and of including a broad set of internship experiences, if possible) in shaping a career path. The presenters will answer the "What is a National Laboratory? (and other) questions and discuss how a National Laboratory experience can provide unique exposure, training, perspective, and skill development to help shape career path and direction with perhaps unexpected and amazing results.

2:45 - 3:3 PM

PROFESSIONAL DEVELOPMENT

Live Your Dreams! Dr. John Harrington, (Retired) NASA, Chickasaw Nation

John Herrington

With humor and humility, Dr. Herrington shares his remarkable journey to the astronaut corps and the International Space Station. As a freshman in college his interests were in the mountains of Colorado, rather than the classroom. Suspended for low grades, he utilized the skills he has acquired as a rock climber and became a member of a survey crew in Glenwood Canyon, CO. His fascination with the work and seeing mathematics in practice for the first time, he followed the advice of his mentors and returned to school to pursue a degree in engineering. As a senior in college he was fortunate to become the calculus tutor for a retired Navy Captain who flew Dauntless dive bombers in World War II. Following his advice he joined the Navy in 1983 and completed a 22 year career in 2005. Mentors and motivation were the key to his success and he encourages others to find their passion in life and pursue their dreams through hard work, determination, and the advice of those that have led the way before.

3:45 - 4:30 PM

BROADENING PARTICIPATION IN COMPUTING

PhD Research and Engineering @ Google

Blaine Bilal

Google's PhD engineers work on an incredibly wide variety of technologies and research areas. This session will review exactly how research gets done at Google: the main focus areas, our current research opportunities, and the kinds of roles we're hiring for.

3:45 - 4:30 PM

BROADENING PARTICIPATION IN COMPUTING

Hispanics in Computing Community

Brianna Posadas

The Hispanics in Computing community was founded a few months before the Tapia 2009 Conference. Since then, the group has been meeting at this annual conference. The group has grown in numbers and online presence (Facebook, LinkedIn, and now a website http://www. hispanicsincomputing.com/). The impact of this gathering in our community has been tremendous. Several members of the community that attended our BoF as young graduate students are now in tenure track positions or employed in research organizations. Once again, we propose to hold our annual BoF at the Tapia Conference. The gathering will allow many of us to meet face to face and discuss issues facing Hispanics. As the undergraduate population attending Tapia grows, it is important that we serve as mentors for the new students starting their careers in computing. The goal for this year's gathering is to explore how to do virtual mentoring to help increase ties within the community. Bringing us together

allows us to continue nurturing and sponsoring younger Hispanics to succeed in computing. By the way, we also take great colorful pictures as seen in the Tapia BOF website.

3:45 - 4:30 PM

BROADENING PARTICIPATION IN COMPUTING

Strategies for Building Momentum and Buy-in for BPC Efforts

Kari George

Broadening Participation in Computing (BPC) is a growing movement that strives to address the inequities and underrepresentation of particular groups (including but not limited to people who identify as women, trans, non-binary, Black, Hispanic, Indigenous, and/or disabled) in computing. Since all voices are necessary to create institutionalized change, this BOF highlights the ways in which faculty, students, and staff are essential to advancing BPC goals. In this BOF session, participants will engage in a discussion of barriers to BPC work, strategies for managing resistance, and how to build buy-in to change culture. Additionally, we will discuss how BPC narratives are shaped and shared with computing departments, stakeholders, and decision-makers. The facilitation team, which includes faculty, staff, and students from the Department of Computer Science at the University of Illinois Urbana-Champaign, will share insights from their multi-institutional research study on how departments select and implement BPC activities. Participants will leave with actionable strategies for supporting BPC work and will build community with others seeking to advance BPC goals.

3:45 - 4:30 PM

TECHNICAL

Multimodal Machine Learning: How to approach?

Dhivya Chinnappa

Multimodal machine learning environment is a scenario where different modalities such as text, image, audio, and video are used in building a machine learning model. In this presentation, I will discuss the techniques used in building these models, the state-of-the-art in multimodal approaches and the caveats to be considered. I will exemplify these approaches using two tasksâ€"possession extraction and extracting event outcomes. I will go beyond the technical factors and discuss ethical concerns when building a multimodal system.

3:45 - 5:00 PM

TECHNICAL

Next-Generation Secure Computer Systems: Post-Quantum Cryptosystems

David Kebo Houngninou, Michel Kinsy

The recent trend in the field of quantum computers has confirmed that it is only a matter of time before these computer systems become functional and readily available. Quantum computers hold the promise of a significant computational power increase. These computer systems will be able to efficiently compute solutions for many computational problems that are NP-hard on conventional machines. While this development presents many compute opportunities, it also deepens our current cybersecurity crisis by making many classical cryptosystems non-secure or critically weakened. For instance, with quantum algorithms capable of efficiently solving the integer factorization and discrete logarithm problems, RSA, ECC, and ElGamal will all need to be re-examined and strengthened since these computational problems form the core of their security. First, we will present a brief history and evolution of quantum computing and computers. Next, we will introduce a set of highly-optimized, parameterizable hardware modules to serve as post-quantum primitives for faster design space exploration of post-quantum cryptosystems, especially cryptosystems using Ring-LWE algorithms. This post-quantum primitive set consists of the four frequently-used security components: the public key cryptosystem (PKC), key exchange (KEX), oblivious transfer (OT), and zero-knowledge proof (ZKP). The OT is used in many privacy-preserving applications, e.g., DNA database and machine learning. Similarly, ZKP is used in several applications; for example, it has been proposed as a candidate for next-generation blockchain algorithms. These primitives will serve as the fundamental building blocks for constructing secure systems in the post-quantum era.

3:45 - 5:00 PM

PROFESSIONAL DEVELOPMENT

Do You Want an Internship? Here's How: A Crash Course on How to Get an Internship in Tech

Alejandro Davila

As a student, you are always told to "get an internship", but no one really shows you how. In this session, you'll learn how to set yourself up for success throughout the application process, including: * How to find an internship during any college year * How to make a plan to apply to and interview with companies * The secrets to successful interviewing

3:45 - 5:00 PM

BROADENING PARTICIPATION IN COMPUTING

What Are Your Papayas? Assimilating to Belong in Computing

Earl W. Huff Jr, Francisco Castro, Earl W. Huff Jr., Gayithri Jayathirtha, Yerika Jimenez, Minji Kong, Natalie Araujo Melo, Amber Solomon, Jennifer Tsan

Systems of power—such as structural racism, which upholds the ideology of white supremacy—are invisible and permeate into our everyday lives and, un/intentionally, into our work. As these systems influence what is held as "ideal", and in turn what is marginalized, participants of the computing field (from minoritized groups) often have to assimilate ourselves and our work into dominant ideals that uphold these structures. Drawing inspiration from the idea of the papaya, a skin-lightening ingredient often used in the Philippines to acclimate to Western ideals of beauty, we center our discussion around the question: What are our papayas in computing? We will examine our papayas, the ways in which we changed our identity, behaviors, or actions to assimilate into the field of computing. This workshop brings together academic (e.g., students, faculty, researchers) and industry (e.g., engineers, managers, researchers) professionals in computing to critically examine current practices and unpack the impacts of systems of power that shape our participation, research and design practices. Such examination is necessary to center equity and justice, and strive towards a critical consciousness in the CS field. To do so, we will investigate questions like the following: What are systems of power? Who has the right to participate? Who has the right to exclude? We will use group-based activities that center historicities and "outsider" knowledge to examine computing practices and theories to answer these questions. We will draft individual commitments that we can make to rid ourselves of our papayas.

4:45 - 5:30 PM

NATIONAL LABS

Current Applications of Data Science from our National Laboratories

Celeste Matarazzo

Data science is the process of using algorithms, methods, and systems to extract knowledge and insights from structured and unstructured data. Data Science is not just about data — It is a multidisciplinary field that brings together computer science, statistics, artificial intelligence, network science and many others. The advancement in Data Science technologies is increasing rapidly with each year with many developments in research and platforms, tools and applications. This session gathers researchers from Department of Energy National Laboratories to discuss their experiences and current applications of data science. Discussion topics will include a variety of applications such as machine learning based data quality monitoring (DQM) in nuclear physics, machine learning advancements for accelerated design of medical therapeutics and machine learning for decarbonizing buildings through modeling, control and optimization.

4:45 - 5:30 PM

BROADENING PARTICIPATION IN COMPUTING

A new class of teaching faculty: No PhD required

Kendra Walther

We all know that the demand for computer science teaching faculty is skyrocketing. As a result, we have noticed that many colleges and universities are beginning to advertise for and hire candidates without a PhD in computer science. What does this mean for the faculty in this position, and how can we promote and support the important contribution that these faculty will have on students? In this BOF, we invite participants from all levels of higher education to explore the experiences surrounding teaching track faculty without a PhD and to begin to envision how our community can systematically support and create alternative paths within academia that will allow potential faculty to earn a master's degree and learn how to be effective teachers at the same time.

4:45 - 5:30 PM

PROFESSIONAL DEVELOPMENT

"INCLUSIVE LEADERSHIP 101: Better people, better People!"

Rodney C. Burris

DESCRIPTION: - "Since I have been doing this work, when was the last time I spent time walking in the roles of those served by our efforts — who did not look like me? - "Have I recently entrusted someone else of a different background / ethnicity / orientation with something very important, knowing that they may not have the tools / network / access to complete it as well as I; yet I entrusted them anyway knowing that the process would be good for their personal/ professional growth, as well as my own? - "If I am being

honest, have I taken measures to be aware of my own internal biases? — As professionals, we must be intentional about our individual efforts towards growth and development. This is because those who are improving, help others to improve also, ---or in other words, "Better people, better People." That's Inclusive Leadership 101. -Rodney C Burris "Rodney C Burris Is One Of America's Top Leaders In Unlocking Human Potential And Inspiring Organizations to Greatness..." — Rodney has assisted numerous companies with team-building, communication, data evaluation and program development. His workshops and seminars are among the most popular in the United States and abroad. ~ LET ME HELP YOUR TEAM OVER ACHIEVE

4:45 - 5:30 PM
BROADENING PARTICIPATION IN COMPUTING
My Autism Journey — From Self-Doubt to Acceptance
Christine Chai

Autism is a genetic developmental disorder which impairs the person's ability to communicate and interact. Autism symptoms may start in a person's infancy, but some people get diagnosed much later in life. My autism journey started when I received a diagnosis right after my PhD graduation in 2017. Through obtaining suitable job positions on my own, I eventually joined Microsoft in 2019 from their autism hiring program (now the neurodiversity hiring program). In four years, I went from self-doubt to acceptance, leveraging my strengths like creativity and pattern recognition in my career. I'd like to highlight not only the communication challenges, but also the available resources which empowered me to achieve more. Companies like Microsoft, SAS, and VMware have launched their neurodiversity hiring programs with success, and there are many benefits in tapping into this underutilized talent pool. People with autism may require accommodations to perform the job, but they often have amazing skills that come with a good return-of-investment for the employer. Although these programs have fewer eligible candidates, I'd like to emphasize that the hiring bar is still the same — the candidate still needs to be able to do the job. When I first joined Microsoft, I thought I was offered the job simply due to less competition. Two years later, I overcame the impostor syndrome because I have received positive performance reviews from my business impact. Microsoft evaluated my performance the same way as others', so I started to feel more confident in my capabilities.

4:45 - 5:30 PM
PROFESSIONAL DEVELOPMENT
Supporting Women in IS, the Importance of Mentoring
Gabriela Gongora-Svartzman

Mentors are often sought when students are in graduate positions, or at more advanced levels in their professional careers, but are overlooked when students are undergraduate. Undergraduate students can feel overwhelmed and anxious about navigating a new environment, a new living situation, a new set of expectations, and all the pressures associated with a college degree. Female students, in particular, can feel uncertain about the career they chose to pursue. This session will give insight into Women in IS, a program founded by a cadre of enthusiastic student leaders during the Spring of 2020, to provide mentorship and support for women in the Undergraduate Information Systems Program at Carnegie Mellon University. Women in IS pairs mentors with mentees from the same program and facilitates their engagement. The program also provides networking activities among peer mentors and mentees, including outside speakers and alumnae events. Women in IS provides women the resources to engage in activism and to support their personal, academic, and professional development. The session organizers will provide perspectives from student mentees, mentors, faculty, and advising staff who have made Women in IS successful and include reflections obtained from the program over the past year. An additional goal of this BoF is a call to action, to create more opportunities for women mentorship, especially at earlier points of their career.

5:45 - 6:15 PM
TECHNICAL, BROADENING PARTICIPATION IN COMPUTING
Dr. Omar Florez
coming soon...

POSTERS
Analyzing scientific data-sharing patterns for in-network data caching
Elizabeth Copps

The volume of data generated by new scientific projects is exponentially increasing, driving up network traffic and data delivery requirements. In-network regional data caching systems are being used to minimize the negative effects of the increased data volume. These systems reduce the number of data transfers from the source by storing files locally. When multiple users need to access the same file, it can be

transferred once and then stored in the cache. Regional caches have been shown to save network traffic volume, reduce data latency, and improve overall application performance. In this work, an in-network XCache system is analyzed to determine how much traffic volume is saved over time. The researchers also studied the system to predict how new caches can be distributed to further decrease traffic volume and increase data availability. The cache system was shown to reduce network traffic by an average factor of 2.91.

Everyday-Inspired Movies: Movie Recommendation System Based on Personal Social Media Posts
Larry Powell, Sharon Chu

Social media has become an integral part of society. People use these systems to communicate with their followers or keep up with family and friends. With this data, one can extract the story and objectives of a person's life just through social media posts. We propose Everyday-Inspired Movies, a movie recommendation system that uses natural language processing to find movies associated with social media posts. We believe the film that is more associative with the person's life will significantly impact and help them grow. Our system will provide better movies that guide people during their lives and motivate them to complete their life goals.

Hyper-Parameter Optimization of Machine Learning Algorithms

Machine learning is a powerful method for modeling in different fields such as education, and its capability to provide an accurate prediction of students' success makes it an ideal tool for decision-making tasks related to higher education. The accuracy of machine learning models depends on selecting the proper hyper-parameters. However, it is not an easy task because it requires time and expertise to tune the hyper-parameters to fit the machine learning model. In this study, we assess the effectiveness of automated tuning techniques in the realm of students' success. Therefore, we add two automated Hyper-ParameterOptimization (HPO) methods, namely grid search and random search, to assess and improve a previous study's machine learning models' performance.

Comparison between research focuses with or without the machine learning techniques when fighting COVID-19
Mecca Thornton

For the past year scientific research efforts have been absorbed by the Coronavirus or COVID-19 pandemic. Researchers have been focused on testing, vaccines, and symptoms among other topics. As a new approach to fighting Covid-19, machine learning has also been included in research methods by many scientists. But few studies have revealed the difference in research focus with or without machine learning techniques in the fight against Covid-19. This study will comparative analysis the word cloud images, and word frequency tables generated from a public dataset (with all the covid-19 research publications) and the dataset, which includes only the machine learning and Covid-19 related research publication, that crawled from google scholar by our team. This study will show how machine learning is affecting the COVID-19 fighting.

Predicting Disease Diagnoses using Electronic Health Records and Computed Tomography Image Biomarkers
Isabel Gallegos, Juan Manuel Zambrano Chaves, Daniel Rubin, Bhavik Patel

Hypertension, type 2 diabetes, and chronic kidney disease are among the most prevalent health conditions in the United States, but their consequences can be greatly mitigated with lifestyle changes and medical treatment if at-risk patients are identified early in the disease development. Previous work has used machine learning models to predict the onset, progression, and complications of hypertension and diabetes using electronic health record (EHR) data, and deep learning methods have been developed to automatically quantify body composition biomarkers in computed tomography (CT) scans to avoid time-consuming manual image analysis. Abdominopelvic CT scans are commonly used to diagnose internal organ diseases, but are largely unused for predicting cardiovascular and metabolic diseases in asymptomatic adults. Therefore, performing cardiovascular disease and metabolic disorder screening using automatically-quantified biomarkers from abdominopelvic CT scans creates new opportunities for early and efficient disease detection. While EHR data and imaging biomarkers have been used independently to predict

cardiovascular and metabolic disease, this work supplements traditional EHR data with abdominopelvic CT-based measurements to build a machine learning model that predicts hypertension, type 2 diabetes, prediabetes, and chronic kidney disease diagnoses. By using this model, physicians can take preventative measures for these conditions, enabling early treatment and thus reducing long-term health effects and medical expenses.

POSTERS
GAN-driven Synthetic Tool Image Generation for Endoscopic Surgical Tool Segmentation
Wenfan Jiang

Accurate semantic image segmentation from medical imaging can enable intelligent vision-based assistance in robot-assisted minimally invasive surgery. The human body and surgical procedures are both dynamic and unpredictable. While machine-vision presents a promising approach, sufficiently large training image sets for robust performance are either costly or unavailable. This work examines three novel generative adversarial network (GAN) methods of providing usable synthetic tool images using only surgical background images and a few real tool images. The best of these three novel approaches incorporates style preservation and a content loss function. The approach is quantitatively evaluated, and results suggest that the synthetically generated training tool images enhance UNet tool segmentation performance. This study is promising towards the use of more widely available and routine screening endoscopy to preoperatively generate synthetic training tool images for intraoperative UNet tool segmentation.

POSTERS
Opioid Prescriptions Prediction from Patient Demographics in MIMIC-IV
Snigdha Kodela, Jahnavi Pinnamraju, Saptarshi Purkayastha

Opioids are widely used analgesics because of their efficacy, mild sedative and anxiolytic properties, and flexibility to administer through multiple routes. Understanding the demographics of the patients receiving these medications helps provide customized care for the susceptible group of people. We conducted a demographic evaluation of the frequently prescribed opioid drug prescriptions from the MIMIC IV database. We analyzed prescribing patterns of six commonly used opioids with demographics such as age, gender, ethnicity, and year predominantly. After conducting exploratory data analysis, we built models using Logistic Regression, Random Forest, and XGBoost to predict opioid prescriptions. We also analyzed the association between demographics and the frequency of prescribed medications for pain management. We found statistically significant differences in opioid prescriptions among the male and female population, various ages, and ethnic groups.

POSTERS
Automatic Target Recognition with Convolutional Neural Networks
Nada Baili, Hichem Frigui

Automatic Target Recognition (ATR) is an important technology for both civilian and military computer vision applications. It is a challenging task as it requires high performance in target detection, target identification and robust image preprocessing in order to deal with the variations of the infrared imagery. Despite the urgent need for efficient and robust ATR systems, the current level of performance that is available is largely deficient compared to the requirements. In this paper, we propose a comprehensive end-to-end Automatic Target Detection and Recognition (ATDR) system that performs both target detection and target classification. We evaluate our system on a large-scale real benchmark dataset that includes civilian and military vehicles. For target detection, we retrain the state of the art object detector YOLO on our dataset. For target classification, we compare and analyze the performances of two state of the art Convolutional Neural Network (CNN) architectures: VGG16 with batch normalization and a Wide Residual Neural Network (WRN). We also experiment with two different loss functions: the regular cross entropy loss and a loss that direcly optimizes the Area Under the Curve (AUC). Since our goal is to build a robust ATR system that can maintain a high performance in real-life applications, we use data augmentation to introduce perturbations to the training target patches. We show that the model VGG16 is the fastest model that achieves the highest accuracy with low false alarm rates, and generalizes the best to targets captured at different resolutions.

Bias Mitigation through Vision Transformers

Sruthi Sudhakar

Computer Vision models exhibit high accuracy rates, making scientists eager to release these models in real-world scenarios. However, several recent studies have shown that these models are exhibiting biases towards certain subpopulations by taking advantage of co-occurrences and spurious correlation between different attributes in the data such as race, gender, and age. Various approaches to mitigate biases have been proposed, and while these algorithms often do reduce bias, they also severely hurt the accuracy of the model, resulting in users having to choose between either accuracy or fairness. In this work, we explore how we can use a recent type of vision model, vision transformers, to mitigate dataset bias. By leveraging the architecture of the vision transformer, we are able to ensure the model learns a fair feature representation of the data to make unbiased predictions. We train vision transformers, using a new loss objective, Transformer Query Loss, on the CelebA dataset for single-attribute predictions where the biased attribute is gender. We visualize the effects of our bias mitigation method. Finally, we validate our findings by measuring the unfairness of the model using the metrics mAP and Equalized Odds, and compare results against current state of the art mitigation techniques.

Learning Sparse Matrix Row Permutations for Efficient SpMM on GPU Architectures

Atefeh Mehrabi

Achieving peak performance on sparse operations is challenging. The distribution of the non-zero elements and underlying hardware platform affect the execution efficiency. Given the diversity in workloads and architectures, no unique solution always wins. In this paper, we improve SpMM efficiency on GPUs. We propose several simple, but effective, sparse data permutations on the CSR data structure. Picking the right permutation over 1,688 datasets improves performance by 1.4Ã—,on average, compared to plain CSR and 2.6Ã—against NVIDIA cuSPARSE. Furthermore, we propose a set of novel features to describe sparsity patterns and their interactions with the kernel and hardware. Using these features, we develop a predictor to select the best permutation for each matrix. Predicted permutations' average gain achieves 96% of oracle gains.

Shape-Preserving Generative Adversarial Network (SP-GAN) for Medical Image Synthesis

Hajar Emami Gohari

Computed tomography (CT) is an essential imaging modality in various clinical applications including radiotherapy treatment planning. In contrast to Magnetic Resonance Imaging (MRI), CT has limited soft tissue contrast and involves radiation exposure side effects for patients. Therefore, estimating synthetic CT (synCT) from MRI data has emerged in the clinic as a means to streamline the clinical workflow. This paper proposes a novel deep learning method, a shape-preserving generative adversarial network (SP-GAN), for synCT generation in challenging disease sites where organ inconsistencies between two modalities are prevalent. In addition to a generator and a discriminator, SP-GAN has a structure segmentation network that automatically segments the organs between the two domains. Through extensive experiments on MRI and CT images from prostate cancer patients, we demonstrate that SP-GAN outperforms all state-of-the-art synCT models and provides clinically acceptable accuracy on synCTs. SP-GAN generates robust, high quality synCTs in seconds and thus offers strong potential for supporting near real-time MR-only treatment planning.

Predicting Fruit Fly's Genotypes from Locomotion Trajectories using Machine Learning

Minh Nguyen, Huy Huynh

A variety of harmful insects have been causing a lot of damages to the global economy. One can argue that image recognition can be used to catch those harmful insects. However, they are too small to be recognized by a normal camera. Based on the study of Drosophila, Drosophila fruit flies have a positional preference, and different characteristics existing among these genotypes. Therefore, we propose a framework to construct genotype classification models using trajectory features. We train the classification models using various machine learning algorithms: Random Forest, Ada Boost, and Gradient Boost. The accuracy of the model yields up to 80%. Hence, this study could improve area-wide not only fruit fly but also insect's management program, leading to better manage performance and reduced harmfulness and costs.

Convolution Padding in Recurrent Neural Networks for Image Denoising with Limited Data

Alex Ho, Jacqueline Alvarez

Recurrent neural networks are widely used in applications for time sequence prediction, such as speech recognition, text prediction, and target tracking. These networks are not popular for image restoration tasks due to the fact that there is no time dependency on images. In this project, we repurpose a recurrent neural network to recover images from noisy observations and investigate convolutional padding to improve the results. Our proposed method artificially creates a time dependency between the image reconstructions at different iterations of the algorithm, allowing us to use a recurrent neural network. In addition, we do not train the network over the many true images. Rather, we only utilize the noisy image. We test our method using images from the CIFAR-10 dataset and present our results using the structural similarity index.

A Multi-Modal Approach for Gender-Based Violence Detection

Hamida Khatri

The impact of living in an unhealthy and unsafe environment leads to perpetuated aggressive and violent behavior. Many organizations have conducted research to identify that violence against women is a deep-rooted issue and has existed for many years. Institutions and women-led groups have gathered to provide assistance and governments have done a lot to least to support the cause. But the severity of this social pandemic is still unresolved across the globe. Research shows that contact with nature reduces the incidence of aggression and violence within family members in a household. Research also shows that air pollution and aggressive behavior are correlated. This paper provides a multi-modal approach to measure Gender-Based Violence Index (GBVI) by detecting the coverage of green canopies using satellite imagery in addition to sensing the level of atmospheric pollution to calculate violence occurrences before they even happen in a given neighborhood. To support the identification process, computer vision technology will be applied to satellite imagery to measure and map out the Vegetation Index (VI) on a scale of 0-100 in a neighborhood along with using air pollution sensors and Internet of Things (IoT) to detect the level of intoxicants that aggravate the cause of violence against women. The result of this approach is promising for organizations like the United Nations, World Health Organization, and government bodies to create rapid response efforts in the interest of women's rights, humanitarians, and security communities.

VerbalEyes: A Large-Scale Inquiry into the State of Audio Description

Lucy Jiang, Daniel Zhu

Audio description (AD), the spoken narration of a video's key visual elements, improves video accessibility for blind or visually impaired viewers. Current processes for incorporating AD are manual and expensive, preventing the widespread adoption of audio description in mainstream media. We conducted user research on preferences for AD within the blind and visually impaired (BVI) community, surveying 107 BVI individuals and interviewing 43 subject-matter experts. We looked for (1) when they use AD, (2) how they use it, and (3) on which platforms they use it. Our main focus was to uncover what they value in a high quality audio description experience, including a range of user preferences for brevity, voice, and audio mixing. Our findings show that the most prominent challenge is the lack of available AD. To advance toward ubiquitous AD, we tested the usability of a tool that we developed to automatically describe videos, which we call VerbalEyes. Through VerbalEyes, we expand on knowledge of AD preferences and propose a solution to provide automatic audio descriptions based on novel user insights.

Improving color vision accessibility in scientific research literature

Winfield Zhao, Kendra Walther

Color vision deficiency (CVD) is marked by the inability or hampered ability for a person to distinguish differences in color. Roughly 8% of the world's population suffers from CVD, which can create difficulty perceiving visual information on an everyday basis. This requires digital platforms to be designed to account for color vision accessibility (CVA) to accommodate for users with CVD. The Web Content Accessibility Guidelines (WCAG) outlines general rules web content must adhere to in order to make its information

accessible to all users, regardless of disability. While websites are heavily regulated for CVA implementation, the figures found in scientific literature published in online journals frequently violate CVA guidelines, which make understanding information for readers with CVD much more difficult. Indeed, this lack of CVA regulation in scientific research publications brings to question the causes for this issue. Thus far, we have conducted an initial screening of published papers from the University of Southern California Biomedical Engineering Department and found that over 60% of papers contain violations in CVA. Moreover, we discovered that over 70% of the journals these papers are published in have no mention of CVA in their rules for proper manuscript submission. Therefore, in this research project, we aim to shed light on the CVA issues within scientific research publications in order to make scientific literature more accessible to readers with CVD.

POSTERS

Understanding the Effects of Virtual Surroundings on Spatial Cognition and Memory: A Pilot Study

Deyrel Diaz, Sean Brown, Quinton Gilliard

Many people experience the encoding specificity principle. This is when people forget what they were doing as soon as they leave their environment; they must go back into that environment to retrace their steps. Many researchers have concluded that environmental visuals and sensory information provide essential cues for memory and spatial cognition. Although the literature is clear that environmental differences generate context-dependent memory, there has not been much investigation as to understanding what aspects of the environment cause these performance differences, and more specifically, within Virtual Reality (VR). In this research, we identified to what extent environmental surroundings affected spatial cognition and memory in VR. Color has been shown to trigger different moods, alter attention, and influence performance; as a result, we started our investigations by looking into primary colors. In this study, we observed how different colored rooms affected spatial cognition and memory. We put 10 participants through 36 possible room-color/set-of-object variants and tested them with recall and spatial placement tasks. We conducted a linear regression and ANOVA analysis to see if there was a correlation of color,

gender, or bias on memory and spatial cognition. Our results hit a ceiling effect, and although differences were seen, it was not enough to vindicate a significant effect of color on performance. We discuss how this experimental design could be changed in the future to produce a higher workload and find significant results. It is essential to understand how virtual surroundings can affect performance to mitigate or enhance VR environment design.

POSTERS

Agriculture Predictive Models In The Era Of Global Warming

Hannah Anderson, Adrian Simmons, Abigeal Gberemicael

The rise in global temperature has wide ranging effects in areas related to human activities, specifically agriculture. Climate change is known to affect the viability of crops and as a result crop production can be heavily impacted. In addition, changes in the local environment can have a dramatic impact on economies whose primary product is agriculture. One way to mitigate the impact climate change has on food security and agricultural based economies is to create models for weather pattern prediction that can be used to preemptively determine which crops would best be suited for a given environment. The predictive analyses are dependent on the local environment, rather than global trends since global and local environments can be affected differently. To develop these predictive models, our group will gather three types of data: crop yield data, historical temperature data, and recent temperature data. Our group will gather these sets of data using freely available government sources and will focus on U.S. based cities and states with large agricultural sectors. Once the data is gathered, cleaned and refactored it will be imported to Tableau which will converge all three datasets and create predictive analyses along with data visualizations. The ultimate goal is to determine if changes in global temperatures have had an impact on the crop production of the selected locations and what kind of impact it will have in the coming years. These visualizations and analyses will provide the users with the information they need to make decisions about their crops.

An Attention Graph Neural Network for Stereo-active Molecules

Quang Tran, Sang Truong

Molecules can show stereochemistry: two molecules with the same atomic connectivity may exhibit different bioactivity due to different spatial arrangements. We design a novel graph neural network architecture that utilizes a stereo-sensitive aggregation function and attention mechanism to improve the performance of molecular properties prediction by exploiting chiral information. Our model is interpretable by allowing visualization of the learned attention weights, providing better support for drug discovery.

Node Centric Community Detection in Evolving Networks

Oluwafolake A. Ayano

Advances in technology have led to the availability of data from different platforms. The data can be represented in the form of a network consisting of a set of nodes connected by edges. The nodes represent the items in the networks while the edges represent the interactions between the nodes. Community detection methods have been used extensively in analyzing these networks. However, community detection in evolving networks has been a significant challenge because of the frequent changes to the networks and the need for real-time analysis. Using static community detection methods for analyzing dynamic networks is problematic since such methods do not retain a network's history and cannot provide real-time information about communities in a network. The existing incremental methods treat changes to the network as a sequence of edge additions or removals; however, in many real-world networks, changes occur when a node is added with all its edges connecting simultaneously. For efficient processing of such large networks in a timely manner, there is a need for an adaptive analytical method that can process large networks without recomputing the entire network after its evolution and treat all the edges involved with a node equally. We proposed a node-centric community detection method that incrementally updates the community structure in the network using the already known structure of the network to avoid recomputing the entire network after each change. The preliminary results from our experiments suggest that our approach is efficient for incremental community detection of evolving networks.

My Phone, My Health App, My Data: Do Menstrual Tracking Apps Support Data Autonomy?

Megan Canavarros

This study assessed menstrual tracking apps to evaluate their current exporting capabilities from the app to healthcare providers, partners, or others. We downloaded and reviewed menstrual tracking apps for their exporting capabilities, exporting file format types, sending medium, and whether the app required a premium upgrade to unlock exporting capabilities. Of the 58 apps reviewed, 19 apps (33%) had exporting capabilities. 7 apps required a premium subscription to unlock exporting capabilities.

Assessing Current Representation of Women's Health Needs in EHR Apps

Megan Canavarros

This study sought to identify the number of women's health apps in the Epic, Cerner, and SMART EHR app galleries. We classified all apps within all three galleries (448 total apps) as either being explicitly dedicated to solving a women's health issue (target group), partially dedicated to solving a women's health issue (peripheral group), or not applicable. One app qualified for the target group and seven apps qualified for the peripheral group.

11:15 AM - 12:20 PM

BROADENING PARTICIPATION IN COMPUTING

Accessibility at Microsoft

Jenny Lay-Flurrie, Chief Accessibility Officer

With more than 1 billion people with disabilities in the world, Microsoft is invested in ensuring our products work for all customers. In this session you'll learn about the evolution of accessibility at Microsoft, what we've learned on our journey, and how we're making accessibility a core part of our culture and how we design and build our products. We'll share our latest accessibility innovations, the importance of inclusive hiring, the impact of COVID on technology, and examples of how AI can empower people with disabilities.

12:30 - 1:15 PM

TECHNICAL

Making Wise Technology Investments Using the Six Machine Learning Essentials

Valerie Nelson, Valerie Nelson, Jason Crea

Machine Learning (ML) and Artificial Intelligence (AI) are generally the response when professionals are asked how technology will improve business processes and organizational outcomes. Although ML and AI are being implemented more than ever to achieve goals in almost any industry, there is a strong, common misconception that ML and AI solutions are just "plug-and-play". In fact, the effective adoption of such technological solutions requires cultural shifts in how we do business which go beyond the traditional "4 V's of big data". Unfortunately, many organizations realize this truth only after investing significant resources into a project, often at a loss, manifested in terms of time, money and technical debt. Later it is discovered that the project fails due to lack of implementation oversight, or the project initially succeeds but resources do not exist or are too expensive to support it long term or at the scale required for optimal utilization. During this talk, we address this phenomenon by presenting guidelines to assess ML projects within a concise set of requirements. Inspired by industry best practices and adapted to address government technology challenges, the six "Machine Learning Essentials" provide criteria for use when planning ML projects to promote each project's purpose, impact, life cycle management, and reliability.

12:30 - 1:15 PM

PROFESSIONAL DEVELOPMENT

How to Navigate Nabbing your Dream Internship

Jessica Kim, Geneo Grissom, Dawn Carter, Brittni Lundie, Cindy Loggins, Joy Osborne

This panel discussion will focus on tips & tricks for students trying to get their dream internship. The very experienced panelists have experience from multiple companies to offer different perspectives and insights. We'll go through questions that we often receive from mentees/students including how to leverage connections, how to utilize coffee chats, coming from non-traditional backgrounds and broader tips on internship hunting.

12:30 - 1:15 PM

BROADENING PARTICIPATION IN COMPUTING

Conversations with Faculty about Student Mental Health

Adam Blank, Kendra Walther

In recent years, campuses across the world have given increasing attention to student mental health. Students are affected by stressors like pressure to meet deadlines, lacking a sense of belonging, and fear of failure. Faculty are getting increasing requests for extensions and leniency due to mental health crises. In this session, the panelists address how they've fostered a culture of support among their students by sharing stories about times they've discussed mental health with students. This session aims to show students that it's okay to share their experiences and to show faculty best practices on answering mental health concerns when they come up.

12:30 - 1:45 PM

TECHNICAL

BRISC-V: A RISC-V Open-Source Architecture Design Space Exploration Toolbox

David Kebo Houngninou, Michel Kinsy

With the introduction of the RISC-V instruction set architecture (ISA) and its rapidly growing ecosystem and community, there may be a unique opportunity to broaden participation in computer architecture design to groups who have been traditionally severely underrepresented. The RISC-V being an open, royalty-free ISA with many extension specifications, offers a high degree of customization and represents an attractive option for many applications, ranging

from machine learning accelerators to secure computer systems design. We will present the BRISC-V toolbox - the Boston University RISC-V based architecture design exploration suite for education and research. BRISC-V comprises different processor architectures, a graphical user interface (GUI) tool to automate fast complete system generations, and a RISC-V assembly simulator. During the session, we will (1) introduce the BRISC-V tool, (2) show its functionalities, and (3) run hands-on design exploration examples with the attendees. Included with the BRISC-V Tool suite are (i) different complexity RISC-V cores (e.g., single-cycle core, multiple-cycle, and reconfigurable pipelined), (ii) a programmable memory system with reconfigurable multi-level cache subsystems, (iii) a parameterized interconnect network, (iv) BRISC-V explorer GUI for automatic synthesizable Verilog core and multicore system generation, and (iv) the BRISC-V simulator for software RISC-V instruction emulation. BRISC-V is an in-browser tool; therefore, it requires no installation and avoids all OS dependencies for an easy, fast, and intuitive use of the tool. It allows students and researchers to experiment with the RISC-V ISA features and quickly bring up complete and fully working architectures.

12:30 - 1:45 PM
PROFESSIONAL DEVELOPMENT
Build your Career and Community through Authentic Personal Branding
Rebecca Andersen

Throw out your elevator pitch and carefully constructed brand. Instead of a fixed, artificial image, personal branding today is dynamic and flexible. Being authentic — and yes, vulnerable! — can help us build community, careers, and 'belonging in tech.' This session will use design thinking to reframe branding as a way to connect with others, foster inclusivity and positive impact towards a joyful life. Leave with a prototype of your personal brand, grounded in your personal story as well as skills, strengths, values, and interests. We will use your lived experiences to craft a narrative of the unique perspective you hold and the difference you can make in your chosen career pathway(s). Finally, learn strategies (including resume, LinkedIn, and networking email templates) for putting your personal brand to work in exploring and building your career.

12:30 - 1:45 PM
PROFESSIONAL DEVELOPMENT
Navigating Research, Teaching, and Service when Traversing from Assistant to Associate to Full
Tracy Hammond, Karan Watson

Whether a tenured, tenure-track, professor of practice, or academic professional track faculty, traversing from Assistant to Associate and Associate to Full can be fraught with difficult challenges, decisions, political traps, and teaching surprises. This mentoring circle will be an opportunity to discuss those challenges in a private space. We will also include some general guidelines and examples of 1) how to understand and interpret your own strengths 2) how to strategically choose service activities that align with your interests and strengths 3) how to create a more inclusive lab and classroom in a way that works with your style and personal strengths, 4) how to navigate the political climate, and 5) how to build your own support network within your own university. We will also create a community of practice that will extend beyond the conference consisting of those who participated in the workshop for those who are interested.

1:30 - 2:15 PM
PROFESSIONAL DEVELOPMENT
Leveraging Personal Growth for Professional Success
Nicole C. Calhoun

This workshop will help participants realize how continued growth is one of the keys to success. Yet this is an area most people take for granted. Participants will learn that in order to maximize their potential, they must become intentional about personal growth. During this workshop discuss: â€¢ The importance of growth plans â€¢ The 8 Hindrances of personal growth â€¢ Action steps for making growth intentional

1:30 - 2:15 PM
BROADENING PARTICIPATION IN COMPUTING
Disability Disclosure in Education and Employment
Brianna Blaser, Stephanie Ludi, Elaine Short, Abraham Glasser, Elba Garza

People with disabilities often have questions about if, when, and how they should share information about their disability in the context of education and employment. It is important to be strategic and intentional about these

conversations, customizing your approach based on your personal preferences and changing your approach in different settings. Panelists will describe their experiences disclosing disability in both education and employment settings and offer advice to others who are navigating these conversations. Participants can learn about strategies for disability disclosure and ways to best support individuals with disabilities in education and employment.

1:30 - 2:15 PM
PROFESSIONAL DEVELOPMENT
Accessibility Research Centers: What they are and how to become involved
Richard Ladner, Jonathan Lazar, Clayton Lewis, Jacob O. Wobbrock

Accessibility research is a broad field that addresses the needs of people with disabilities to engage more fully in society. Accessibility researchers design, build, and study technologies that benefit people with disabilities. They also investigate the intersection of technology and disability from a policy perspective. There are three notable centers of excellence in accessible computing research, namely, the Trace Research & Development Center at the University of Maryland at College Park, the Coleman Institute for Cognitive Disabilities at the University of Colorado, Boulder, and Center for Research and Education on Accessible Technology and Experiences (CREATE) at the University of Washington in Seattle. Each center is a collaboration of researchers and practitioners from multiple degree granting departments and schools within their universities. Leaders from these centers comprise the panel. They will describe the goals and activities of their centers and how students can get involved. Generally, students working in these centers are from various departments and schools within the particular university. This means to work in one of these centers as a graduate student you need to apply to the graduate program in at least one of the affiliated departments and schools.

1:30 - 2:15 PM
NATIONAL LABS
Avengers: Perspectives on Cyber Security for Critical Infrastructure from our National
Stacy Hartley-Bride, Amanda Joyce, Charisa Powell, Andy Bochman, Rima Awad

Critical infrastructure sectors are ones whose assets, systems, and virtual and physical networks are considered so vital to the United States that their damage or destruction would be catastrophic to our nation's security, economy, and/or public health. The Department of Energy's national laboratories perform scientific research and analyses to help secure our nation's infrastructure. This session will explore some of those approaches to serve as a lens to the impactful innovation performed at national laboratories. Topics will include the recent high-visibility cyber-attacks targeting the Colonial Pipeline and an attempt to poison the water supply at a water utility in Florida.

1:30 - 2:15 PM
PROFESSIONAL DEVELOPMENT
Where do I fit?: Success Strategies That Have Helped Me as a Tech Professional
Mikela Wright

Tech Modernization is ever-changing and 70% of professionals experience Imposter Syndrome. Organizations continue to evolve, resulting in Tech professionals quickly 'mastering' tech advancements in Software Engineering, Cloud Computing & Data Migrations, and beyond. Join Mikela Wright, as she walks through skills and strategies to incorporate being your authentic self, while juggling Technology efforts.

2:30 - 3:45 PM
PROFESSIONAL DEVELOPMENT
Performing Confidence: Embrace, Experience and Embody
Bushra Anjum, Raquell Holmes

Confidence includes belief in one's past achievements, current competence, and future ability to succeed. However, repeated research studies have shown that societal, psychological, systemic messages contribute to self-doubt for women and minorities when it comes to their abilities in STEM disciplines. Conversations on Diversity Equity and Inclusion have rocketed from the sidelines to the main stage of academic and corporate conversations. This creates a new kind of pressure to perform confidence in the face of unnerving conversations. This interactive session creates the opportunity for participants to discover their personal approach and style of confidence via performance and improvisation! The workshop combines experiential exercises with critical reflection, and discussion to help the participants develop and create instances of confidence — voice, posture, emotions — that will increase their capacity and ability to powerfully respond to doubts and challenges at work.

2:45 - 3:30 PM

PROFESSIONAL DEVELOPMENT

OJT Bootcamp: Developing STEM Professionals the Right Way

Valerie Nelson

The modern STEM workforce consists of professionals spanning a very broad spectrum of skills from a long list of disciplines that are often not traditionally tied to one's job. Despite the strong demand to create teams possessing a diversity of skills to tackle challenging problems, it can still be difficult for employers to hire the "ideal" candidate who has it all, particularly since "having it all" can come in many forms and often requires attaining lots of prior relevant experience. Even when educational backgrounds are directly related to one's job duties, academic training is rarely sufficient to adequately prepare new employees to immediately thrive in their new STEM work experience. As a consequence, employers are often found in a situation where they must develop their employees into the unicorn they desire, yet their approach is often ad hoc, inconsistent, and sometimes ineffective. This is especially true when hosting internships when there is minimal time available to train interns quickly enough to position them to add real value to the organization during their short tenure. Despite these challenges, employers can host meaningful On-The-Job (OJT) experiences that benefit both the organization and the STEM employee at any skill level when a deliberate approach is taken. In this talk, we look at some core technical qualifications to consider when developing STEM leaders, then present a process for organizing and executing holistic OJT experiences that incorporate opportunities to develop those technical leadership skills while also making significant contributions to their organizations.

2:45 - 3:30 PM

BROADENING PARTICIPATION IN COMPUTING

Cross-pollinating Undergraduate STEM Education Using Project-Based Learning

Velma Latson, Deidre Gibson

An adapted engineering process and elements of project-based learning are used to "cross-pollinate" STEM education for undergraduate students at two Historically Black Colleges and Universities (HBCUs). The goals of the project are to 1) improve student critical thinking skills, 2) encourage innovative solutions, and 3) demonstrate relationships and/or connections between STEM disciplines.

2:45 - 3:30 PM

Broadening Participation in Computing

Teach Access Virtual Study Away

Kendra Walther

Accessibility is an important part of designing and building products, yet many undergraduate students are not receiving any instruction on how to design for accessibility. Teach Access[1,2] was founded in 2015 as a joint endeavor between industry and academia to address this issue. As part of the larger Teach Access initiative to include accessibility topics in higher education, we discuss our experience designing and hosting a four-week virtual study away program with over 80 students from nine universities across the US. During the program, faculty and students participated in sessions with accessibility experts from a variety of technology companies. Students learned about accessibility and assistive technologies, heard from disability advocates, learned about career paths in accessibility, engaged in AI and VR research in accessibility, discussed racial justice, intersectionality, and disability rights, thought about accessible design and hosting accessible events, and had the opportunity to apply their knowledge in a team project. Student participants were placed in four to five person cross-disciplinary, multi-institutional teams and competed to build their own accessibility focused awareness or technology project during our Accessathon.

2:45 - 3:30 PM

TECHNICAL

Disasters happen, be prepared!

Shadi Khalek, Shadi Khalek, Kaitlin Barnes

Software and online-based industries aim at providing services and products virtually at any time of the day and any day of the year. However, in practice, these industries must be prepared to keep their services running in the face of natural or human-induced disasters. Putting in place a plan for quick recovery from a disaster can save businesses significant amounts of money and prevent a disaster from causing irreparable harm to a business and its users. Join Google Cloud engineers to hear about how GCE empowers its users to be more resilient to disasters and how Google tests its resilience and ability to recover from failures within its own developer ecosystem. We will showcase tools and infrastructure that we have built to test and validate GCE services resilience to different kinds of disasters, such as fault injection techniques, outages and disaster simulations. Finally,

we will present how this infrastructure was baked into the developers ecosystem, with focus on shifting tests to the left and our ability to scale disaster test execution times by more than 10X.

2:45 - 4:00 PM
PROFESSIONAL DEVELOPMENT
Centering Learning and Equity in Assessment
Victoria Chávez, Sarah Brown

This hands-on workshop is intended to provide faculty and graduate students teaching computer science (CS) courses an opportunity to modify their courses to better motivate and engage students via centering learning and equity in their courses' assessment. Participants will learn about various assessment methods, explore their applications to various CS courses, and modify a syllabus or assignment for one of their courses based. The workshop will be supported with a workbook (guide) developed by the presenters so participants can continue to engage in their learning and course modification beyond the conclusion of the workshop. Participants will need to bring the syllabus and 1-2 assignments for the course they are interested in revising. Limited to 20 participants.

2:45 - 4:00 PM
PROFESSIONAL DEVELOPMENT
Moving from career anxiety to career exploration!
Rebecca Andersen, Rebecca Andersen

"What do you want to be when you grow up?" This question may seem simple when posed to a child but takes on a new meaning when asked of a college student or working professional. Often it seems there is an unspoken rule that we must have it all figured out - we need an entry career plan, a five-year plan, and even a plan for what we will do during retirement! The need to have 'the answer' to our careers implies there IS an answer, when in fact our careers (and lives) are unique, evolving, and impossible to define. There is no one perfect career, pathway to fulfillment, or map to achieve happiness. The concept that you must find your career and climb the ladder to achieve success is outdated; instead we must recognize that opportunities come from growing our interests into skill sets, taking chances to ask questions and explore possibilities, and being open-minded about what the future brings. This session will reframe career uncertainty and anxiety into healthy career exploration and an open-minded approach. Participants will learn how to

use the design-your-life framework (pioneered by Stanford faculty, Bill Burnett and Dave Evans) to build their future (rather than solving their future). Through this design thinking approach, we will practice developing career goals and working through the career search process - with less stress and more confidence! Together, we will learn how to create Planned Happenstance, transforming unplanned events into opportunities for learning and career growth.

3:45 - 4:30 PM
BROADENING PARTICIPATION IN COMPUTING
Navigating the Waters of Allyship
Natalie Veilleux, Camilo Hurtado, Leila Elorfi, Angel Leon

Leveraging an innovative storytelling format called Pecha Kucha, this presentation features four speakers that will each speak for exactly six minutes and forty seconds — 20 slides: 20 seconds per slide. Each talk will approach embracing allyship from a unique perspective. The session will begin by diving into diversity and inclusion and the importance of prioritizing this for your teams. A diverse environment helps pave the way for further allyship. The next talk demonstrates how allyship is then strengthened by having empathy for journeys and ideas that are not your own. Our third talk steers the ship towards the animal kingdom, to show what powerful lessons we can learn about being allies from a hive of bees. In our final talk, we'll discuss how to show grit and resiliency in your life and how these characteristics are integral to both becoming an ally and partnering with allies. The atmosphere that Pecha Kucha creates results in speakers staying on their toes as slides automatically change quickly and audience members being engaged throughout.

3:45 - 4:30 PM
BROADENING PARTICIPATION IN COMPUTING
En Español, Academic Pathways in Computer Science
Brianna Posadas, Manuel Pérez-Quiñones, Carlos Bautista, Heriberto Acosta-Maestre, Nery Chapetón-Lamas

10.1% of bachelor's degrees and 1.7% of PhDs in computer science go to Latinos in the United States. Latinos are underrepresented in the computer science field and many students who start with an interest in computer science drop out due discrimination, bias in science and technology, and lack of community. This panel, with professionals and

graduate students from all across the academic realm, will present students with a representation of Latinos in the field of computer science. This Spanish-language panel will provide students the opportunity to learn how to prepare for different academic pathways.

3:45 - 4:30 PM

BROADENING PARTICIPATION IN COMPUTING

Diversity Includes Disability Includes Mental Illness: Expanding the Scope of DEI Efforts in Computer Science

Christian Murphy

Despite the important and long overdue increase in the number of diversity, equity, and inclusion (DEI) initiatives in Computer Science, these efforts tend to be focused on diversity in terms of race, gender, socioeconomic status, etc. and run the risk of overlooking the needs of students living with disabilities, who may also feel underrepresented and marginalized in our field. More specifically, few of these endeavors are targeted toward students living with diagnosed mental illness despite the current mental health crisis, which is already having an effect on the field of computing. This session seeks to explore ways in which current DEI efforts in Computer Science can be expanded to be more inclusive of students living with diagnosed mental illness. Rather than serving as a critique of the shortcomings of existing DEI practices, we seek to create a space for a constructive and open conversation. We will discuss how current outreach efforts, recruitment and retention strategies, mentorship opportunities, community building, career advancement, etc. can be broadened and modified to meet the unique needs of students living with mental illness, while at the same time seeking to erase any stigma and misconceptions that may cause others to marginalize and exclude these students. In this timely and important session, participants will have an opportunity to discuss issues that affect CS students living with mental illness, share resources that are available for both students and educators, and describe efforts to create and foster a culture of understanding and support for neurodiverse communities within computing.

3:45 - 4:30 PM

BROADENING PARTICIPATION IN COMPUTING

Real World Impact through Innovative Research and Curricular Programs

Ziba Cranmer, Roscoe Giles, Roscoe Giles, Derry Wijaya, Gonzalo Rosales

The past 18 months have elevated the urgency for academics and students to engage in the world outside the borders of the university. For those in computing and data science disciplines, this is easier said than done. At Boston University, the newly created Faculty of Computing & Data Sciences (CDS) is committed to knocking down the walls between academia and "the real world." Come hear how, through innovative curricular programs, faculty and students are collaborating on impactful research to make a difference on issues of justice, equality, and fairness. Elaine Nsoesie, a computational epidemiologist and Assistant Director of Research at BU's Center for Antiracist Research will talk about how she is using experiential learning programs to engage students in real-world impact while advancing her research agenda. Derry Wijaya will share learnings from working with external partners from media and civil rights to apply natural language processing to create working prototypes for news agencies seeking to understand implicit bias in their coverage of communities of color. Gonzalo Rosales, a Computer Science major at Boston University, will speak about his student journey as he pursued opportunities to bring real-world impact into his college experience by engaging in innovative curricular and co-curricular programs.

3:45 - 4:30 PM

NATIONAL LABS

HPC in a nutshell - an introduction to various topics in High-Performance Computing

Kevin Brown, Sreeranjani (Jini) Ramprakash

High-performance computing (HPC) has broad applicability in various scientific domains. The Department of Energy (DOE) National Laboratories house some of the most powerful HPC centers in the world along with deep staff expertise to support ground-breaking science and engineering. In this session speakers with significant HPC experience at the Department of Energy will introduce the audience to the following topics: - Parallel programming using OpenMP

- Building a HPC cluster with Raspberry Pis - Scientific visualization in HPC Attendees will walk away from this session with pointers to useful tutorials and materials that will provide ways to gain deeper knowledge of HPC.

3:45 - 4:30 PM
PROFESSIONAL DEVELOPMENT
Balancing thought and people leadership
Harsha Srikara

I've heard from senior developers / managers and others that leadership can be often broken down into two parts. There is "thought leadership" and "people leadership". These two parts often co-exist and are both equally important to the growth of a successful team. Thought leadership is focused on technical capability or more generally the ability to engineer a roadmap for product development. People gravitate towards thought leaders to answer questions when they don't understand a topic or when they look for guidance in become more skilled in their profession. Thought leaders are the "tech gurus". People leaders on the other hand fill a very different gaps in leadership. They manage everything people related as the name suggests. Communication, conflict resolution, managing relationships with different stakeholders and more are their forte. For this birds of a feather discussion, I'd like to propose a discussion to help budding students & those who are early in their career find a balance between these two types of leadership as they mature into roles in the future that require them to rise up to one or the other. How should people go about choosing one to focus on or the other? How does one stay close to the product development when management seems to be the only way up? How can one who's predominantly focused on one type of leadership gain exposure to the other? These are all questions that can be discussed in this birds of a feather discussion.

4:30 - 5:15 PM
PROFESSIONAL DEVELOPMENT
Teaching and Learning Accessibility
Kendra Walther

Teach Access is collaboration among education, industry, and disability advocacy organizations to address the critical need to enhance students' understanding of digital accessibility as they learn to design, develop, and build new technologies. Come discuss how and why JEDI (justice, equity, diversity, and inclusion) efforts should include disability, how teaching and learning about accessibility can powerfully impact your work, and brainstorm new ways to teach accessibility in order to provide more opportunities for students.

4:30 - 5:15 PM
BROADENING PARTICIPATION IN COMPUTING
Owning your story: How being the child of immigrant parents can make you a better industry professional
Kathy Wang

Being the child of immigrants means that Kathy was the unofficial mediator during family arguments, where eastern and western values clashed all too often. But it also means that she's become an industry professional who can strongly empathize with her teammates, because she had to empathize with those around her in order to survive. Being the child of immigrants means that Kathy was editing work emails and negotiating legal contracts for her mom when she was 12 years old. But it also means that she's become an industry professional who embraces working in complex industries and navigating technical jargon, because she's been doing it since she was 12. As Brené Brown said, "You either walk inside your story and own it or you stand outside your story and hustle for your worthiness." In this session, Kathy invites students and early-career professionals to reflect on the way that they frame their own stories, and how they can leverage those stories to communicate their strengths and advance their careers.

4:30 - 5:15 PM
BROADENING PARTICIPATION IN COMPUTING
Leveraging Data for Good: Using Data to Create Equitable K-12 CS Education
Sarah Dunton

This BOF centers around K-12 CS education data and the ways it can be used to understand CS equity. The organizers will share their experiences wrangling and harnessing CS education data at the K-12 level to promote equity. This includes experience working with data from the US census, the National Center for Education Statistics, the

College Board, and state departments of education. Based on these experiences, the organizers will start conversations with participants about what K-12 CS education data currently exists and how that data can be used to explore issues of equity in computing. National, state, and local data repositories will be discussed, as well as how to access those data sources. While sharing their research questions, the organizers will encourage participants to brainstorm research questions that can explore or address equity issues in computing. Of particular interest is identifying questions that can inform policies and practices that address inequality in CS access. The organizers will provide feedback about how those questions can be addressed and with what data and analysis techniques. Facilitators: Sarah T. Dunton - ECEP Alliance; Miranda Parker - University of California, Irvine; Shana White - Kapor Center; Mariam Saffar Perez and Colleen Lewis - University of Illinois at Urbana-Champaign.

4:30 - 5:15 PM
PROFESSIONAL DEVELOPMENT
How to get that dream career
Jacqueline Chung

I'd like to talk about the struggles for international students to get a job post-COVID. I also want to give advice around leveraging community, mentorship programs, volunteer opportunities, freelancing, and more to get their dream career. Then, I would like to discuss how my team t International Hub has been trying to solve those pain points during and after the pandemic. International Hub is an online community and database that contains sourced opportunities that empower early-career professionals in Canada and internationally with professional development resources to achieve their dream careers. In light of growing unemployment and the role of international travel in the initial spread of the pandemic, there is a risk of a backlash in public opinion against immigrants. A number of communication campaigns are aimed at addressing this issue, with a particular focus on tackling misinformation regarding the role of immigrants in the spread of the virus. There has been a significant increase in demand for internship opportunities, post-graduation, immigration opportunities, career counselling resources, scholarships, and upselling programs. International students and professionals will be looking more carefully than ever at national policies enabling them to work during their studies and to pursue employment after graduation, costs of living in destination countries and cities, and scholarship opportunities. International Hub helps students access the many resources out there for international students, but it is not all easily accessible. My mission aims to help all international students and professionals to develop professionally and land their dream careers.

5:30 - 6:15 PM
BROADENING PARTICIPATION IN COMPUTING
Tapia Past Chairs Panel
Valerie Taylor, Bryant York, Pamela Williams, Manuel A. Pérez Quiñones, Dilma Da Silva, Tao Xie

Tapia 2021 represents 20 years since the first Tapia Conference, which was held in Houston, Texas, October 18-21, 2001 with 164 attendees. There have been 15 conferences since the inaugural conference. Initially the Tapia Conferences were held everyone two years but moved to annual occurrence in 2014. This session entails former conference chairs providing unique observations about past Tapia Conferences as well as insights about future conferences.

11:15 AM - 12:20 PM

PROFESSIONAL DEVELOPMENT

Dr. Cecilia Aragon, Author, Airshow Pilot, University of Washington

What do the following two careers have in common: (1) data science professor, and (2) airshow pilot? Spoiler alert: math and computing. These subjects ended up being useful in the two very different careers Cecilia Aragon pursued. They were also her personal superpowers, used to overcome agonizing fears and accomplish life goals. In this talk she presents examples from her life and work in aviation, astrophysics, and data science using images, video, and even equations. She'll also talk about overcoming expectations as one of the few women — or Latinas — in both of her careers..

12:30 - 1:15 PM

PROFESSIONAL DEVELOPMENT

When It Hits the Fan: What to do to Survive a Mental Health Crisis as a Professional

Courtney Thurston

Mental health is increasingly talked about in the workplace; however, these conversations tend to center platitudes, clichés, and well-meaning phrases which do not actually meaningfully help professionals in crisis. What exactly does it mean to "take time for yourself," anyway? More importantly, what objective steps do you actually take when you find yourself in the midst of a mental health breakdown? What are you actually supposed to do if you "burn out?" There is traditionally very little guidance given on what specific steps a professional should consider taking should they find themselves in crisis. Rather, conventional employer-sponsored advice typically caters to and merely addresses mild, non-job-threatening cases of "the blues." This session will not offer medical advice; it will instead outline a series of considerations and actions to take to facilitate time away; to acquire professional mental health services; to decide who to share information with and how to do so; how to protect sensitive information; how to find and approach powerful sponsors at work; and more. The thought of losing a job in the middle of a mental health crisis often deepens that crisis, sending suffering individuals into a spiral-down tailspin. This session will focus on specific thoughts, actions, and scripts that professionals can leverage to mitigate this risk, aid in ending negative feedback cycles, and get professional/family/friends' support to regain stability and normalcy in the attendees' professional and personal lives.

12:30 - 1:15 PM

BROADENING PARTICIPATION IN COMPUTING

The SWDCS Alliance: A RPP Focused on Broadening Participation of African American and Hispanic Students with Disabilities in Computer Science and Artificial Intelligence

Shetay Ashford-Hanserd, Shailen Singh, Ada Muoneke, Phillip Eaglin

During this 45-minute presentation, members of the Students with Disabilities in Computer Science (SWDCS) Alliance will share current research outcomes of a research study focused on computer science and special education teachers' serving as co-teachers in a research-practice partnership funded by the National Science Foundation's Computer Science for All (CSforAll:RPP) program. The Alliance aims to increase African American and Hispanic students with disabilities' interest, engagement, learning, knowledge, and persistence in computer science (CS) and science, technology, engineering, and mathematics (STEM) careers, through project-based voice user interface (VUI) and artificial intelligence (AI) instruction and tech mentoring. During this session, the presenters will share the qualitative research findings describing CS and special educators' perceptions about the effects of an informal VUI and AI intervention program on the learning, knowledge, and persistence of African American and Hispanic students with disabilities in CS and STEM careers.

12:30 - 1:15 PM

PROFESSIONAL DEVELOPMENT

Technology Transfer in Academia

Wanda Eugene, Juan Gilbert

University technology transfer and licensing offices play a vital role in the commercialization of research innovation. However, for many faculty and students, the functioning and resources of their university technology transfer and licensing offices are often foreign and underutilized. This lack of awareness inhibits life-changing research from transferring out of the lab, limits economic opportunity, and can sometimes foster institutional distrust. As a result, many colleges and universities spend more to manage their tech transfer and licensing office than they produce. This lack of awareness only tells part of the story. Busy research faculty are often not incentivized to pursue tech transfer and licensing, as its impact on tenure and promotion isn't substantial enough to stimulate interest. The complexities of moving research to market matched with the challenges of engaging research faculty and students in tech transfer inevitably stifle engines of innovation across the country. In this panel, we will explore

the core of these dynamics, discuss the experiences of faculty who have ventured this path, and lay a foundation to increase engagement in tech transfer and licensing among university faculty and students.

12:30 - 1:15 PM
PROFESSIONAL DEVELOPMENT
Build a Social Media Presence to Grow and Advance Careers: the Minority Edition
Cindy Le

In the digital era when networking is no longer limited to face-to-face interactions, how can we leverage the power of social media for professional development? Cindy Le, a software engineer at Google with a global audience of 100k+ followers, will teach you step-by-step how to build a social media presence, create valuable content, and gain additional career opportunities from online interactions.

12:30 - 1:45 PM
TECHNICAL
Data Streaming and Real-time Data Analytics
Sireesha Pagolu, Sridhar Mutyala, Srinu Dasari

This will be interactive workshop where attendees will understand and gain insights to real-time data streaming and what streaming analytics are. With the growth of internet-of-things (IoT) devices, we see that overall data volume is increasing day to day. We have engineering advancements that helped led to new ways of collecting, processing, and analyzing data. These advancements made it seamless in providing real-time analytics by processing streamed data. We will focus and understand what data streaming is, why is it important and different mechanisms used in streaming real-time data. We will touch on multiple stream processing with concurrency while addressing small response time and no data loss. We'll take a look at data streaming, real-time processing, and the difference between traditional and streaming analysis with real-life examples of it. Core concepts will be covered in this session with structured activities to keep the attendees engaged and help envision the future of data analytics and understand on how efficiently it is used currently.

12:30 - 1:45 PM
TECHNICAL
Cloud-Enabled IoT Workshop: AWS IoT and Google IoT Platforms
Smriti Bhatt, Deepti Gupta

In the future, Smart Communities will become a part of our lives with the exponentially growing number of IoT devices and new emerging IoT domains, from Smart homes to fully autonomous smart communities with smart transportation, smart health, and smart cities. In this workshop, we plan to present and implement Smart Home and Smart Healthcare use cases on Cloud-Enabled Internet of Things (IoT) platforms, focusing on two major Cloud services providers and their IoT platforms, i.e., Amazon Web Services (AWS) IoT, Google Cloud Platform (GCP) IoT Platform. This workshop is based on a combinational approach of lecture-style and hands-on experiments. In today's condition with COVID 19, this workshop can also be implemented through a virtual environment with Cloud and their IoT platforms and device SDKs. This workshop is aimed at undergraduate and graduate students who want to learn and develop hands-on expertise on IoT devices and platforms. It also applies to the faculty and other researchers who are interested in smart communities and their security and privacy aspects, including the implementation of real-world IoT use cases on Cloud and physical devices, such as Raspberry Pis.

1:30 - 2:15 PM
TECHNICAL
Introduction to Deep Learning using CNNs
Christabel Sitienei

Convolutional Neural Networks have revolutionized many industries: healthcare, banking and more. Despite its transformative power, CNNs remain a blackbox that's difficult to make out, even for industry professionals. This workshop will attempt to demystify what CNNs are through real-life tangible exercises. Using active coding exercises, I will work through the definition of a CNN, how it differs from other machine learning methods, go through a simple training example and culminate with a discussion on the ethics of deep learning.

1:30 - 2:15 PM
BROADENING PARTICIPATION IN COMPUTING
Accessibility Makes Sense for Everyone
Michael McCabe, Carolyn Hermes

A live, interactive Mentimeter-based presentation that explores the basic concepts of digital accessibility and the motivations behind JPMorgan Chase's commitment to building and buying inclusive technology. We will demonstrate several commonsense examples for how to start creating accessible applications and content through a series of interactive questions that attendees can answer via their mobile devices. Follow-up slides for each question will show attendees how to identify, then avoid or correct potential accessibility issues. Presentation wrap-up includes a PDF handout with links to available resources for accessibility and inclusive design.

FRIDAY | PROGRAM SCHEDULE

1:30 - 2:15 PM

PROFESSIONAL DEVELOPMENT

Job Searching during COVID-19: Sharing Reflections, Advice, and Feedback for an Equitable Experience

Mariela Hernandez

Finding a new grad tech job as a womxn of color is hard enough, but when COVID-19 hit, the stakes felt even higher. In this session, we will learn about resources that made this job search feel empowering, such as leaning on community and allies for support. We will also reflect on the context that shaped this past year and what brought up feelings of disquiet, especially as minoritized students. Lastly, we will detail the systemic barriers that caused stress and discontentment throughout the job searching process to inform companies and their employees about actionable changes they can employ to ensure recruitment is more equitable, inclusive, and empowering for all. Through this, we will come together to discuss, heal, and learn from one another in order to build community and support. Students in their last year of college, as well as recruiters from tech companies, are particularly encouraged to come.

1:30 - 2:15 PM

BROADENING PARTICIPATION IN COMPUTING

Understanding of the needs of students with disabilities based on Universal Design of Learning principle

Hongye Liu, Kendra Walther, Lawrence Angrave, Erin Carrier, Zhilin Zhang, Harsh Deep

This panel will discuss the needs and satisfaction of computer science students with disabilities (SWD) wth courses, and share insights, best practices, and experience of using Universal Design of Learning (UDL)-based approaches to provide inclusive accessible computer science content. We will discuss examples of the "tyranny-of-the-majority" where the needs of a subset of students are ignored or unheard, and how educators can address this barrier to inclusive education. SWDs face additional challenges when digital content is inaccessible or difficult to use. Empirical evidence of UDL's benefits to computer science education is limited. Members of this panel have employed UDL in their courses and conducted a large-scale survey and follow-up interviews in understanding the needs of SWD and the use of UDL approach for computer science education. This research includes understanding learning needs of students via surveying usability and satisfaction of ten types of course modalities including online lectures, recordings of lectures, labs, instructor notes, lecture transcripts, discussion boards. Statistical analyses of CS and other engineering courses' outcomes and student interviews found all students in a course benefited from multiple modalities of content delivery in online learning, but also statistically signficant differences between SWD and students without disailities e.g., searchable captioned videos (Wilcoxon test: $p<0.05$) (ASEE 21). We will present survey and interview research results that support the adoption of a UDL approach to course design and delivery, including searchable transcriptions, and suggest first steps for educators interested in adopting UDL.

1:30 - 2:15 PM

BROADENING PARTICIPATION IN COMPUTING

Increasing Diversity in Computing: Sharing of Good Practices

Valerie Taylor, Richard Ladner, Ayanna Howard, Juan Gilbert, Carol Fletcher, Jannie Fernandez, Andrea Tirres, Jamie Payton, Rose Robinson

This panel provides an opportunity for representatives from the NSF-funded Broadening Participation in Computing Alliances and other organizations to share their good practices about increasing diversity in computing. The panel will begin with an introduction to the following NSF BPC Alliances and other organizations: AccessComputing, CAHSI, CMD-IT, CRA-W, ECEP, iAAMCS, NCWIT, and STARS. The panelists will share information about their organization and how their programs have broadened participation in computing. We will provide significant time for discussions with the different organizations.

2:45 - 3:30 PM

BROADENING PARTICIPATION IN COMPUTING

Innovative Ways to Improve Small Liberal Arts College Computer Science Department Cultures, Communities, and Curricula

Jared Mejia

Across the United States, small liberal arts college (LAC) CS departments are struggling with exploding enrollments, severe understaffing, and a growing tension to accommodate the needs of students interested in the field while maintaining an intimate learning environment true to the liberal arts spirit. At the same time, many of these departments are trying to work through issues such as the place of ethics and equity in curricula, how to support underrepresented students, how undergraduate teaching assistant (TA) programs should function, and how to foster a sense of department community. Though small colleges have limited resources to devote to solving these problems, LACs also have certain

unique qualities that can be brought to bear, including the adaptability inherent in a smaller community, strong and communicative student-faculty relationships, and a focus on the success of each individual. For instance, Pomona College has a system whereby a group of students are selected to be department "liaisons" to provide a student perspective on department issues. This year, the CS student liaisons have advocated for increased ethics and equity content in courses, built virtual community in the face of the pandemic, planned improvements to the TA system, helped to support a "cohort" for underrepresented students, and improved student-faculty communication, illustrating how progress may be made even when department resources are stretched thin. In this BoF session, we present our attempts to improve our CS department's culture, community, and curriculum, and lead LAC students and faculty in discussing further strategies for addressing these problems.

2:45 - 3:30 PM
PROFESSIONAL DEVELOPMENT
Understanding & Leveraging Diversity In Job Search
Rishal Stanciel

As a Diversity Recruiter and Career Coach for MLT for nearly 13 years, I have learned a great deal about recruiting for diverse candidates. All of my 1000+ students that I have recruited and coached have secured internships and 90% of eligible students have secured high trajectory post undergrad roles. MLT Fellows have secured opportunities and salaries that exceed the national average of students measured by NACE and other organizations. I would love to share recruiting strategies and skills with diverse students to assist them in reaching their career goals. This workshop will be beneficial to all diverse candidates seeking to better understand how to build a solid brand with recruiters and secure amazing Internship and full time roles with top fortune companies. Additionally, I will share the MLT value proposition with freshmen and sophomore students from throughout the country as we exponentially scale our class for 2021 and 2022. We have alums working in CS/PM/Tech roles at Google, Facebook, Apple, LinkedIn, Dell, Salesforce, Adobe, Intuit, Goldman Sachs, Deloitte, Credit Suisse, JP Morgan, Citi, and many other top companies. Having specific insight from Corporate Recruiters, serving as Corporate hiring manager for 15+ years, and prepping actual applicants has provided me a unique perspective on how to increase the applicant's ability to drive tremendous results. I would love to share these key strategies at this year's conference. Please feel free to peruse my LI profile for related comments from the undergrad/young professional target audience: linkedin.com/in/rishal-stanciel-52570b

2:45 - 3:30 PM
TECHNICAL
Have you heard of the saying " UX is a fluffy science"? If you have worked in industry, I'll bet you have
Hanan Alnizami

Have you heard of the saying " UX is a fluffy science"? If you have worked in the industry, I'll bet you have. Many are aware that Human Factors(HF) considerations and User Experience(UX)/Design methods are all pivotal components of the development and deployment of a products and technology. However, everyday examples of failed market products prove that UX was either disregarded or has failed to drive engineering requirements that dictate the experience deployed. The latter takes shape for many reasons, one specifically is when user experience and human factors experts deliver qualitative, sometimes even quantitative data, that engineers find difficult to interpret as pertains to the experiences being implemented in industry. Mapping UX to engineering requirements to drive hardware and software specifications is a practical skill that every UX and HF expert should aspire to have, to debunk what engineering may consider a soft or fluffy science. Let's chat about UX, the gap that is currently recognized between UX and engineering, and how you may play a critical role in mending the differences between the two to be successful.

2:45 - 3:30 PM
PROFESSIONAL DEVELOPMENT
So You're a New Latinx Faculty â€¦ Now What?
Oscar Veliz

2020 came with unexpected challenges and hurdles, among them graduating from a Ph.D. and obtaining a job in academia. This BoF will provide perspective, advice, and experiences of a postdoctoral and assistant professor entering the workforce in 2020. The session presenters will talk about their experience interviewing for academic jobs remotely and then onboarding and working at a new academic career remotely. Discussion topics will include the struggles of teaching at a new university, adapting to new college culture, and even meeting new colleagues virtually; then transitioning into in-person. We will also address the tenure process with tips on navigating the hurdles with guidance on how to interact with your committee. Additionally, the

presenters will explore unique insights from being Latinx as a new faculty member and assimilation with a different culture, while still maintaining identity and heritage. After this initial share, the session presenters hope to have meaningful discussions centered on audience questions with preference from graduate students, hoping to enter academia, as well as insights from novice and veteran academics.

2:45 - 3:30 PM

BROADENING PARTICIPATION IN COMPUTING

Diversity includes Disability

Brianna Blaser

There is great diversity among individuals with disabilities, but there are also many common experiences. This Birds of a Feather session will bring together people who have a disability or who are interested in supporting individuals with disabilities. The goal of the session is to learn from each other about strategies for achieving success and ensuring that computing fields are welcoming and accessible to individuals with disabilities. Topics discussed will include: accessibility in computing education, disclosing disability status in interviews, recruiting and retaining employees and interns with disabilities, and including people with disabilities in broadening participation activities. The session will include information about internships, mentoring, and career development opportunities for students with disabilities as well as resources for educators and employers who would like to be more welcoming and accessible to individuals with disabilities.

2:45 - 4:00 PM

PROFESSIONAL DEVELOPMENT

A Seat At The Table: Candid Conversation on Diversity, Equity, and Inclusion

Kevin M. Coleman

In the workshop "A Seat At The Table: Candid Conversation on Diversity, Equity, and Inclusion — Are you ready to talk?", the audience will participate in an interactive training, that will help them think differently about Diversity, Equity, Inclusion, and Justice. We will remove misconceptions, and stereotypes and engage in thought provoking dialog that will be the catalyst for change and acceptance of everyone in this high-octane social unrest environment. I guarantee that the audience will leave with at least 5 to 10 practices and principles they can activate in their personal and professional lives immediately.

2:45 - 4:00 PM

TECHNICAL

Cyber Forensic Analyses: When There is More Than Meets the Eye

Maria Vicente Bonto-Kane, Maria Vicente Bonto-Kane

The workshop presents a simple method of steganography without using sophisticated tools. An image file, a sunset picture of a field of blue bonnets, gets embedded with four other files. The sunset image remains undisturbed and the image looks like the original unmodified image. Examination of the file using a hex editor shows the header and trailer signatures of the four other embedded files. These files are carved out and extracted showing that they are intact. The workshop presents techniques for hiding data, techniques to "identify" hidden data, and methods to ensure the integrity and safety of files using hashing techniques.

4:15 - 5:30 PM

Awards Ceremony, Richard Tapia Award Presentation and Closing Remarks

Jamika Burge

The Richard A. Tapia Achievement Award for Scientific Scholarship, Civic Science and Diversifying Computing is given annually to an individual who is a distinguished computational scientist, computer scientist or computer engineer and who is making significant contributions to civic areas such as teaching, mentoring, advising, and building and serving communities. The individual is also one who demonstrates extraordinary leadership in increasing the participation of groups who are underrepresented in the sciences.

CONFERENCE ORGANIZATION

Association for Computing Machinery

The Association for Computing Machinery (ACM)
www.acm.org

CMD-IT's mission is to ensure that our target communities are fully engaged in computing and information technologies and to promote innovation that enriches, enhances, and enables these communities so that more equitable and sustainable contributions are possible by all communities. CMD-IT advocates for African Americans/Blacks, Native Americans/Indigenous People, Hispanics/Latinx, and People with Disabilities in IT, and supports students and professionals via workshops that focus on building leadership skills and career development. CMD-IT helps students and professionals in computing to network and create lasting connections with others in the field, and serves as a resource for those who wish to promote the development of our target communities within computing.

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Center for Minorities and People with Disabilities in IT
Fostering Innovation Through Inclusion

Center for Minorities and People with Disabilities in Information Technology (CMD-IT)
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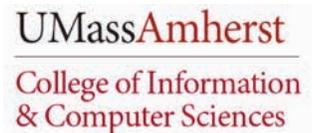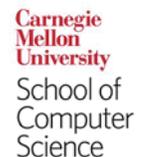
(ACADEMIC SUPPORTERS CONTINUED)

SILVER

BRONZE

NONPROFIT SUPPORTERS

PLATINUM

GOLD

SILVER

BRONZE